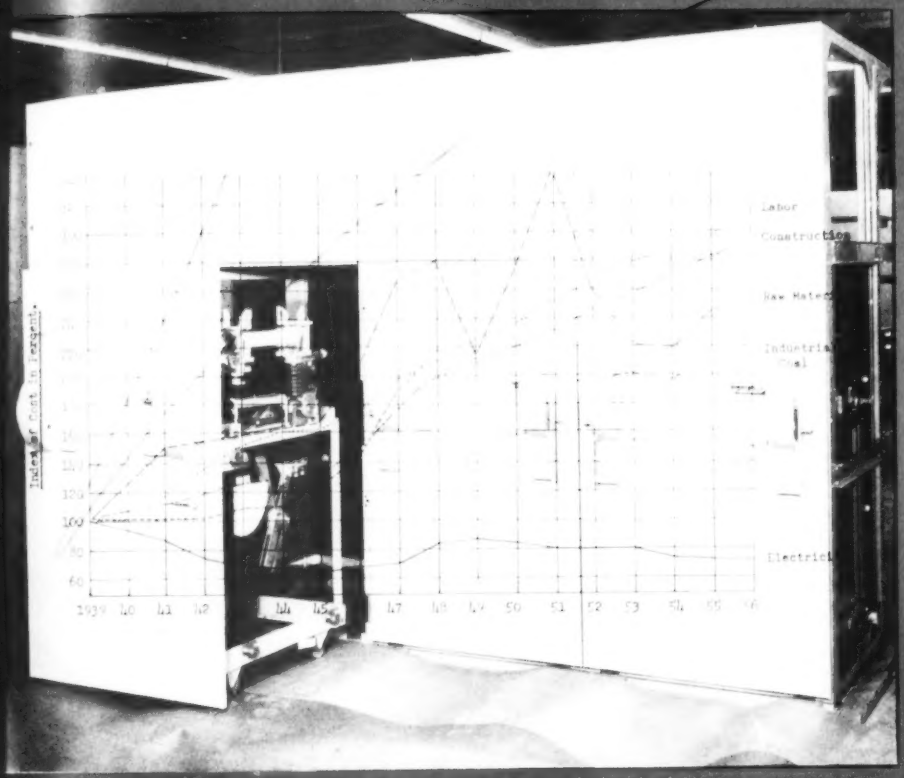
DECEMBER 1960

The Paper Industry



...planning electrically, the unit substation with removable switch and fuse, pro-...ides complete safety. Super-imposed chart shows declining cost of electric power.

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TECHNOLOGY DEPARTMENT

Reducing mill costs by planning electrically

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Forest industry as affected by world affairs

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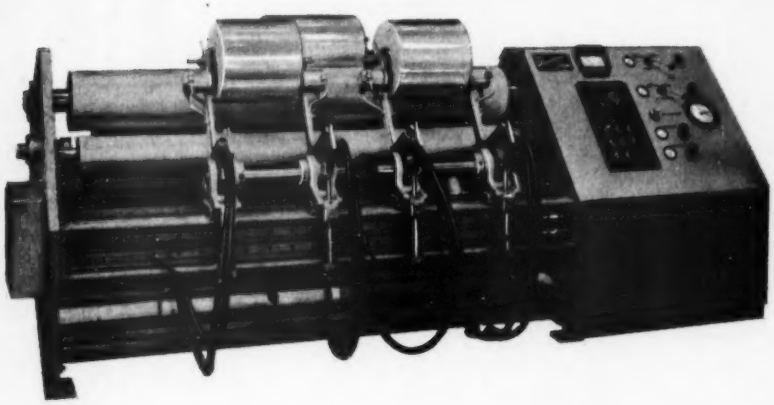

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 42 **NUMBER 9** **DECEMBER 1960**

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

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THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950 issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

BPA

Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

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Fritz Publications wishes all its readers and advertisers a very pleasant holiday season and a prosperous new year.

The PAPER INDUSTRY is indexed regularly in Engineering Index and Industrial Arts Index. An index to each volume is issued annually by the publisher as a part of the April number.

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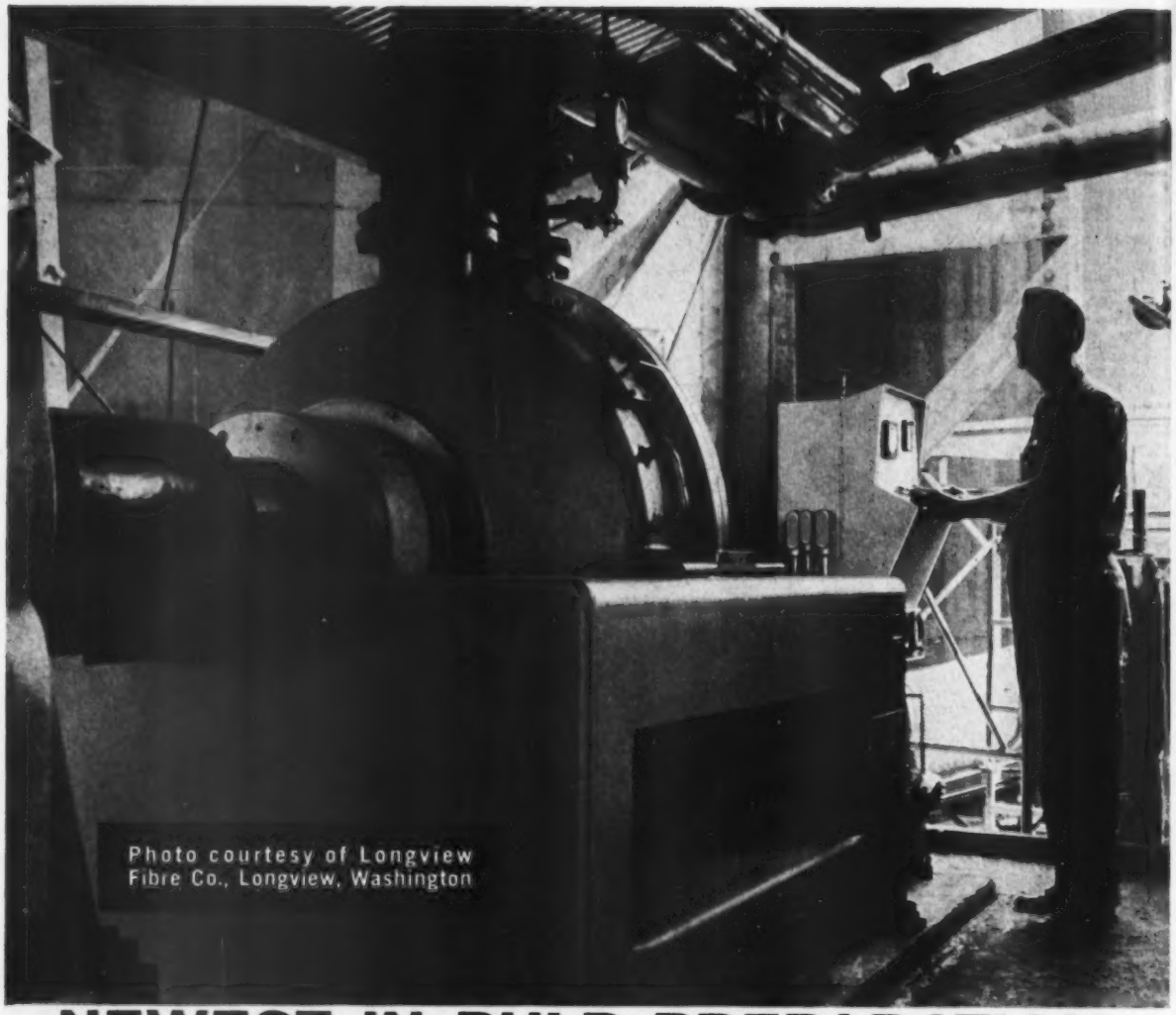

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From our point of view..

What do our readers want?

Whether it is one of the symptoms of the social revolution that is sweeping every country, we seem to sense a certain restlessness among the readers of various business publications. The revolt seems to be directed against the apparently inescapable task of having to go through so much extraneous and irrelevant material in order to get at the few solid facts that can be put to a purposeful use by the busy executive, the engineer, the chemist, or the practical paper maker.

The revolt also seems to be directed against the excessive use of editorial pages for the verbal build-up and edification of individuals and pieces of equipment, when most of the basic facts showing individual contributions and performance of equipment could be put down in a few effective sentences.

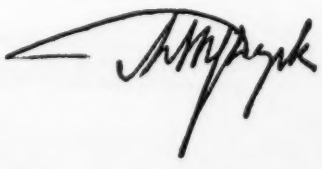
The need in this competitive world — with its unrelenting demands for the attention of management's minds — without question is for timely, accurate, and concise information, as well as for an editorial approach that focuses on problems and on new horizons. It is only through the recognition and definition of such problems and the extension of its interest to new horizons that a business paper can contribute to the security of the industry it serves and therefore also, indirectly, toward the security of this nation.

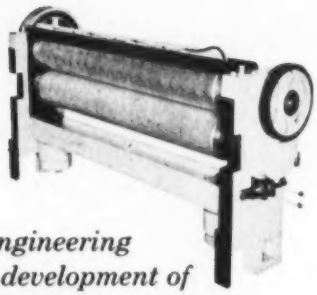
The social revolution that is enveloping us today will give rise to new industrial centers, a reorientation of many markets, and new sources of raw materials that already begin to affect deeply this country's trade pattern. The changing picture in the forest industry, in this connection, is broadly sketched by J. A. Liersch in an article in this issue.

There is nothing that is likely to slow the rate of acceleration toward the industrialization of other countries. The sensible thing to do would be to help it along with creative and constructive contribution to give it better direction, and channel our own efforts into this general upsurge so that we become a part of the new renaissance.

As in the past, it remains the intention of this publication to keep abreast with new developments and — what is every editor's dream — keep a few steps ahead of the reader. The dissemination of information, however, is a cooperative undertaking which involves a two-way flow of ideas. Most of the ideas have their origin in the people who build and operate the industry we serve. It is the function of the publication to process them, combine those from different sources, and feed them back to the reader in more complete form.

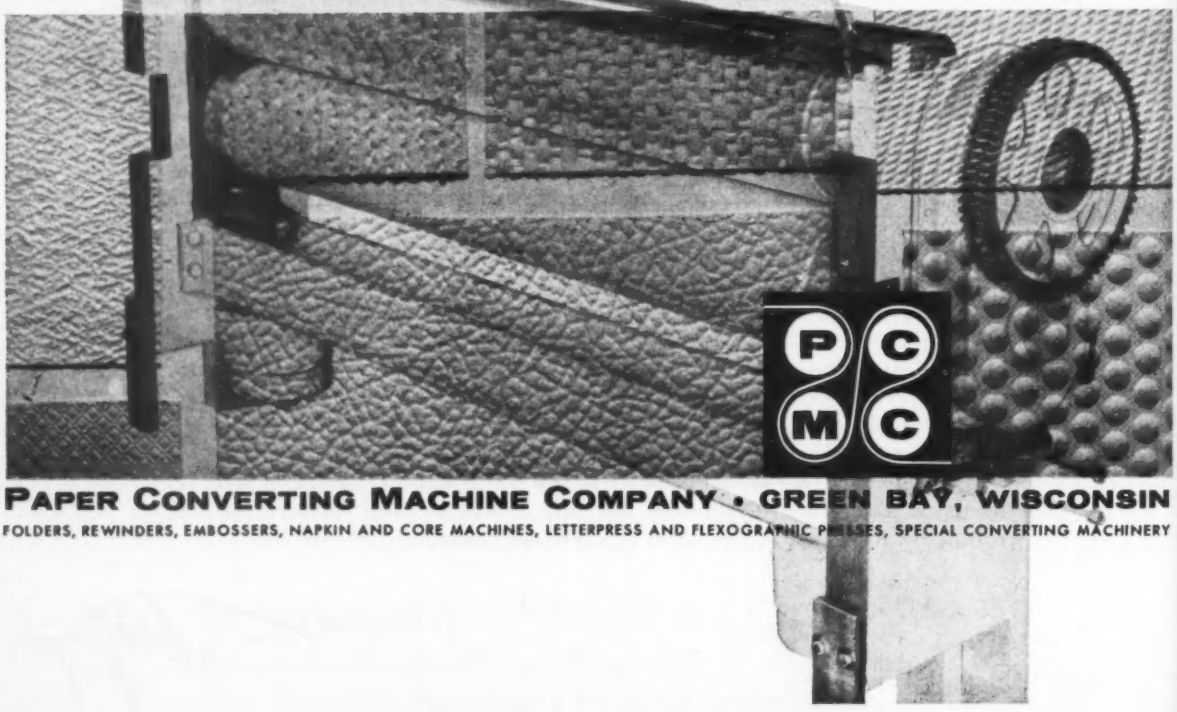
We invite a free exchange of ideas and constructive criticism on readers' wants, as well as contributions in the form of articles. Will you start the ball rolling by giving us your views in letters to the editor?





Creative engineering and development of converting machinery

A new embosser with matched steel rolls is the latest development from Paper Converting. Available as a separate installation or an attachment to rewinders, folders or printing presses, this new embosser features fully enclosed, oil lubricated herringbone gears and precision spherical roller bearings with tapered inner race arranged for hydraulic removal. Embossing rolls are air loaded with precision adjustable nip control, allowing for positive adjustment and accurate positioning, should the rolls be separated, then brought back together. Cleaning and lubrication of the rolls are automatic. If you are looking for the answer to *your* particular problem and desire the *exceptional* in converting machinery, contact Paper Converting... *now.*



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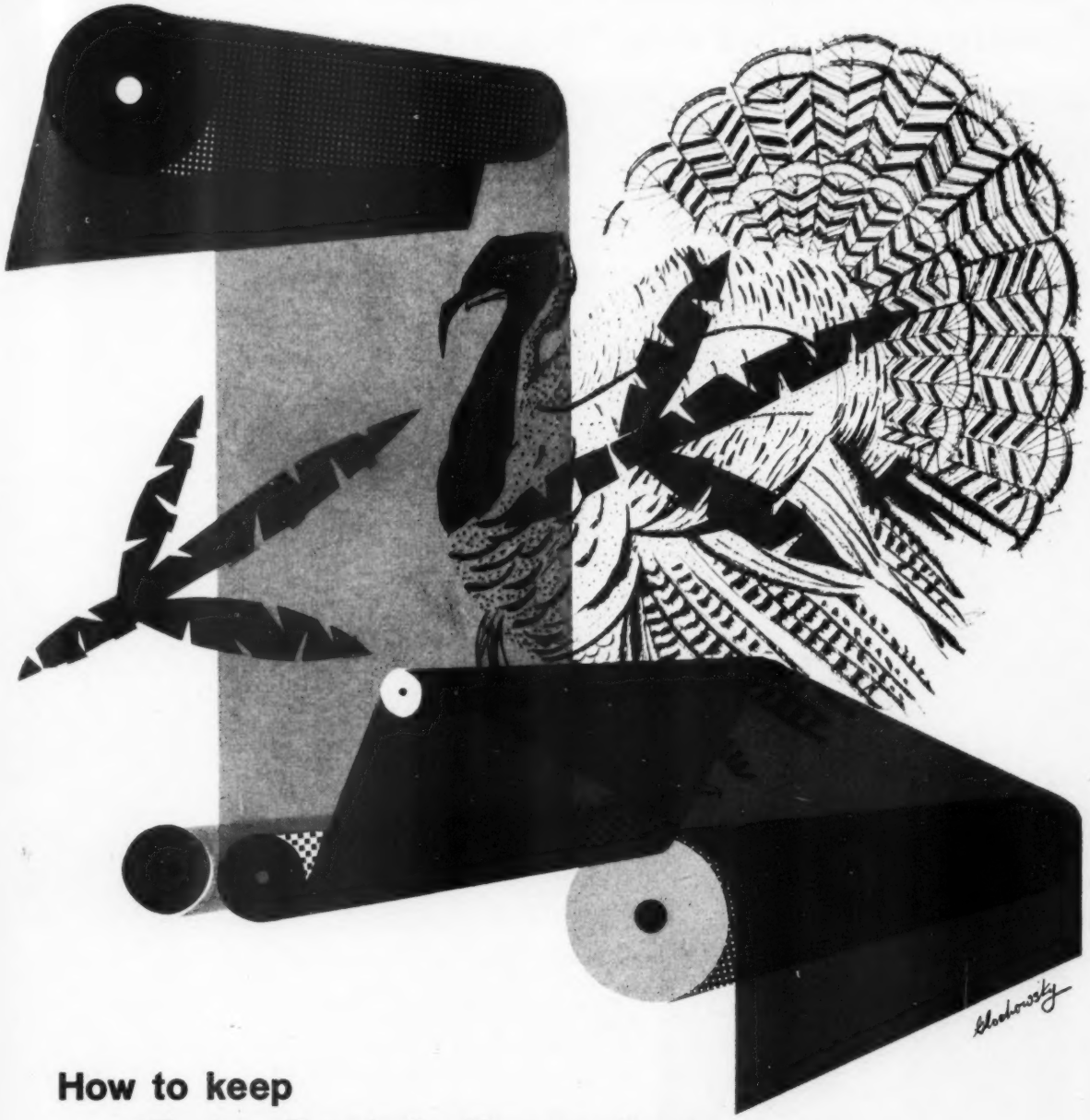

How to keep "Turkey Tracks" off your sheet

Whether turkey tracks, hen tracks, orange peel—whatever term you use to describe these imperfections, remember this: Ethylex Gums produce superior surface sizings almost free of patterning. Exceptionally strong film-forming characteristics and self-leveling flow properties assure uniform distribution of size. Ethylex Gums control penetration, improve gloss ink hold-out.

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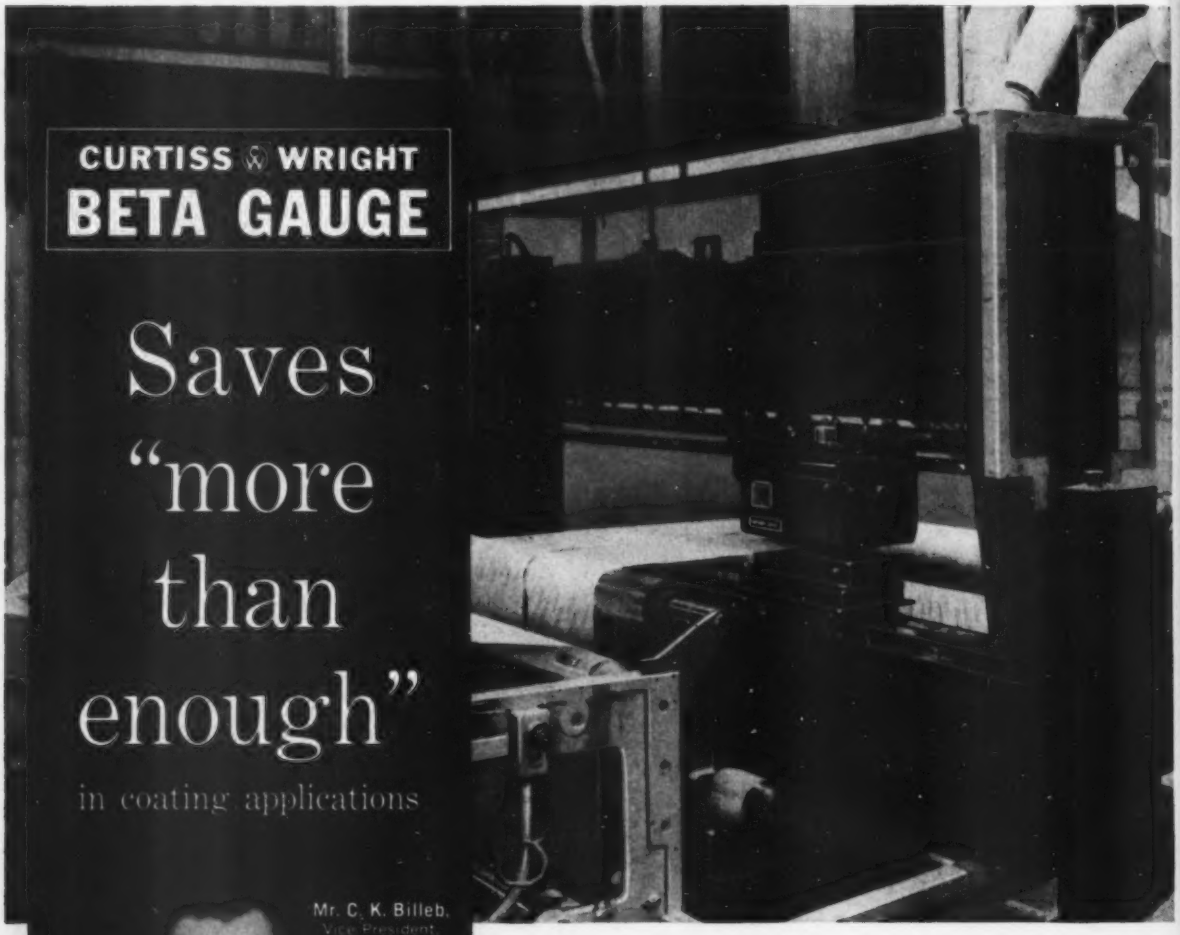

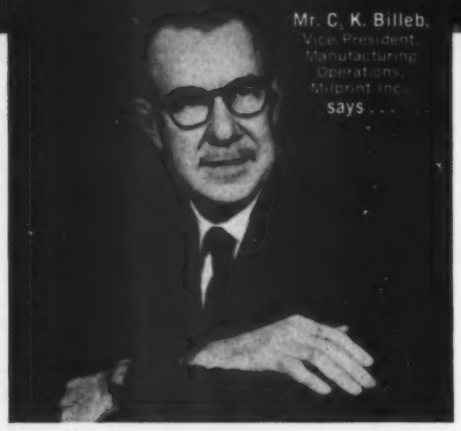

"Before installing Curtiss-Wright Beta Gauges at Milprint, it was necessary to apply 'more than enough' costly coating material as insurance against not meeting minimum specs. Now our Gauges enable us to produce more uniform wrapper products as well as make a substantial decrease in waste and in-process reject material—prove their worth in daily operation."

Milprint has also found their Gauges to be a valuable engineering tool for studying process variables and analyses of production operations.

Curtiss-Wright Beta Gauges measure basis weights in coatings, paper, plastics, rubber or similar materials accurately and instantaneously without contacting material or affecting the process in any way. For time and money saving details, phone SWinburne 9-0500 or write.

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New ideas for paper industry progress are important aims of Albany Felt Company.

Some achievements already developed are now contributing to increased production and higher quality paper and paperboard. Other new ideas under test in our laboratories promise even further advancements for the future.

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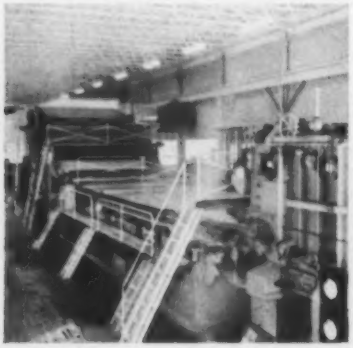

Valley is at your service from the Headbox to the Reel

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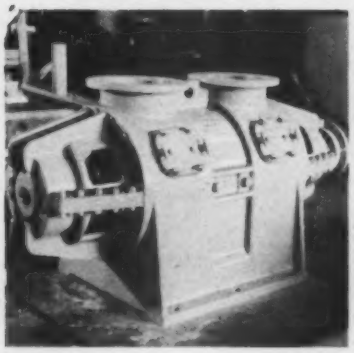

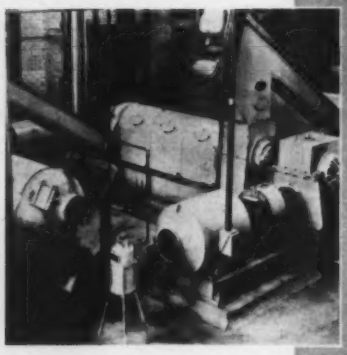

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Or, WETstrez P-682-35, another modified U-F resin. It is designed for optimum performance with coniferous wood pulps. In either product, the name WETstrez means more wet strength per dollar!

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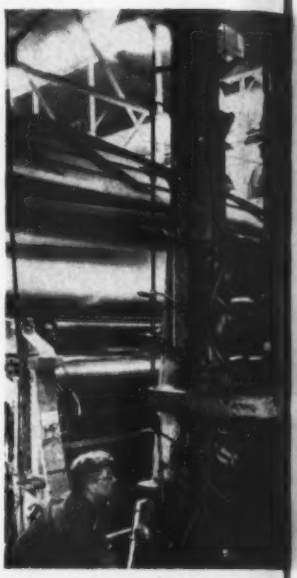
"10 HOURS DOWNTIME WOULD COST OXFORD PAPER CO. MORE THAN ITS LINCOLN CENTRALIZED LUBRICATION SYSTEM"

Oxford Paper Company put Lincoln's Centro-Matic* lubricating system to the test at its Rumford, Maine, mill 17 years ago. A trimming machine had been going "down" for bearing repair at least once every 90 days until the centralized system was installed. The measured lubrication proved so effective that not a single bearing failed during the following year.

Other trimmers were soon included in the program. Now Centro-Matic lubrication has been extended to heavier mill equipment (final stacks on paper machines, trunnion bearings on barking drum, head pulley on waste conveyor).

"With normal production of 600 tons of finished paper per day, every minute a machine is down is extremely costly," reports Franklin V. Heald, supervisor of lubrication at the mill. "By eliminating just 10 hours of downtime, a Centro-Matic system pays for itself. Lincoln lubrication has slashed our bearing maintenance costs and resultant machine downtime to less than 25% of their former levels."

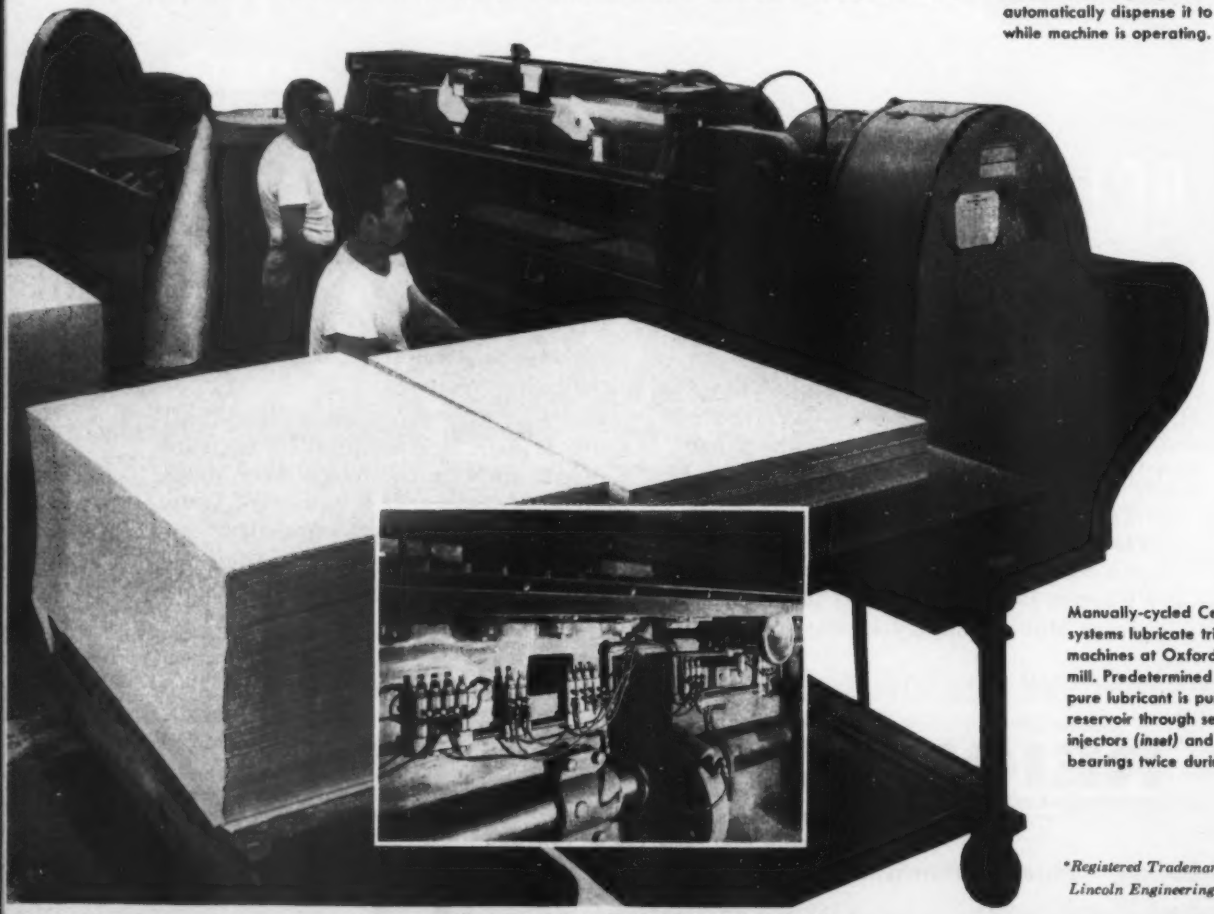
For detailed information on the part automatic centralized lubrication can play in lowering your production costs, write for Catalog 81 and Lincoln's new case-history brochure, *A Report to Management.*



Injectors along vertical side of stacks on paper machine receive lubricant at proper intervals from clock-controlled pump and automatically dispense it to bearings while machine is operating.

LINCOLN
ENGINEERING COMPANY

5010 GOODFELLOW BLVD., ST. LOUIS 20, MO., DIVISION OF THE McNEIL MACHINE & ENGINEERING CO.



Manually-cycled Centro-Matic systems lubricate trimming machines at Oxford's Rumford mill. Predetermined amount of pure lubricant is pumped from reservoir through sealed lines to injectors (*inset*) and fed to bearings twice during each cycle.

*Registered Trademark, Lincoln Engineering Co.

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On even the heaviest of woodyard conveyors, around either lumber or pulp mills, these Link-Belt chains give you the staying power necessary to keep operating and maintenance costs at a minimum.

C Class combination chain with steel sidebars, and center links of malleable or *Promal*, is a favorite conveying chain throughout the industry. Specify file-hard *Promal* for highly abrasive conditions (as with sandy bark) and for the extra strength and wear resistance demanded by heavy loads. And for even heavier duty conveyors, SS Class bushed chain is interchangeable on the same sprockets.

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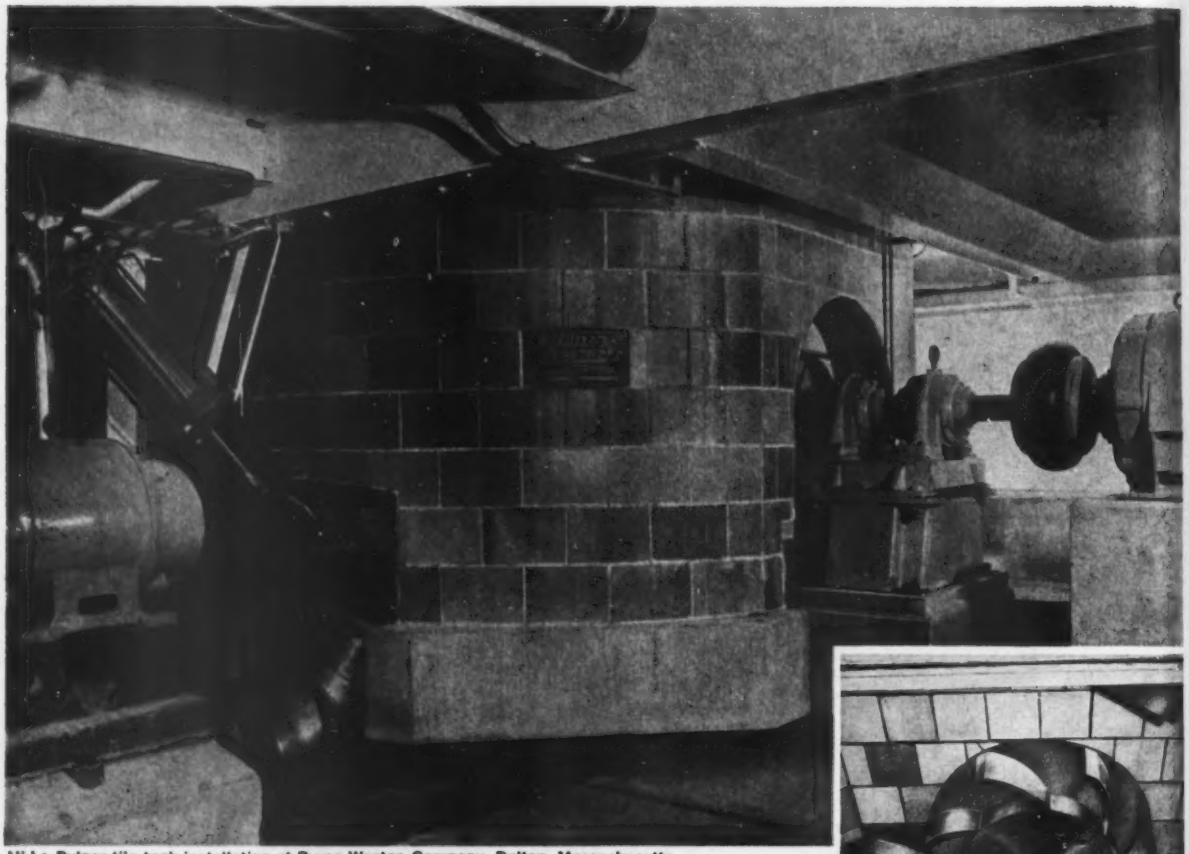
Tile Tank Hi-Lo Pulper at Byron Weston Company

SOLVES LOW HEADROOM PROBLEM



Hi-Lo Pulper tile tank installation at Byron Weston Company, Dalton, Massachusetts.

The low speed rotor, with large curved blades, provides quick breaking and maximum circulation, forcing stock across the tank to the high speed rotor for defibering.

In January of 1960 Byron Weston came to Jones with a special pulping problem. To produce their high grade cotton fibre papers Byron Weston uses a wide variety of hard-to-defibre furnish. They needed a pulper that could handle this furnish efficiently, but . . . here was the problem . . . they also needed a pulper which could be installed in 10′ headroom and still handle 35 tons per day.

Jones engineers solved both problems effectively with a specially designed tile tank Hi-Lo Pulper. It meets the limited headroom requirements without sacrificing the proven efficiency of the standard height stainless steel tank Hi-Lo.

Designed for batch or continuous pulping with low power consumption, the Jones Hi-Lo Pulper can be installed in areas where the headroom is as low as 6½′.

The notched blades of the high speed rotor, turning at an average tip speed of 7600′ per minute, project only ¼" and use power most efficiently for defibering. The blades, held securely by duroid wedges, can be easily replaced.

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Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

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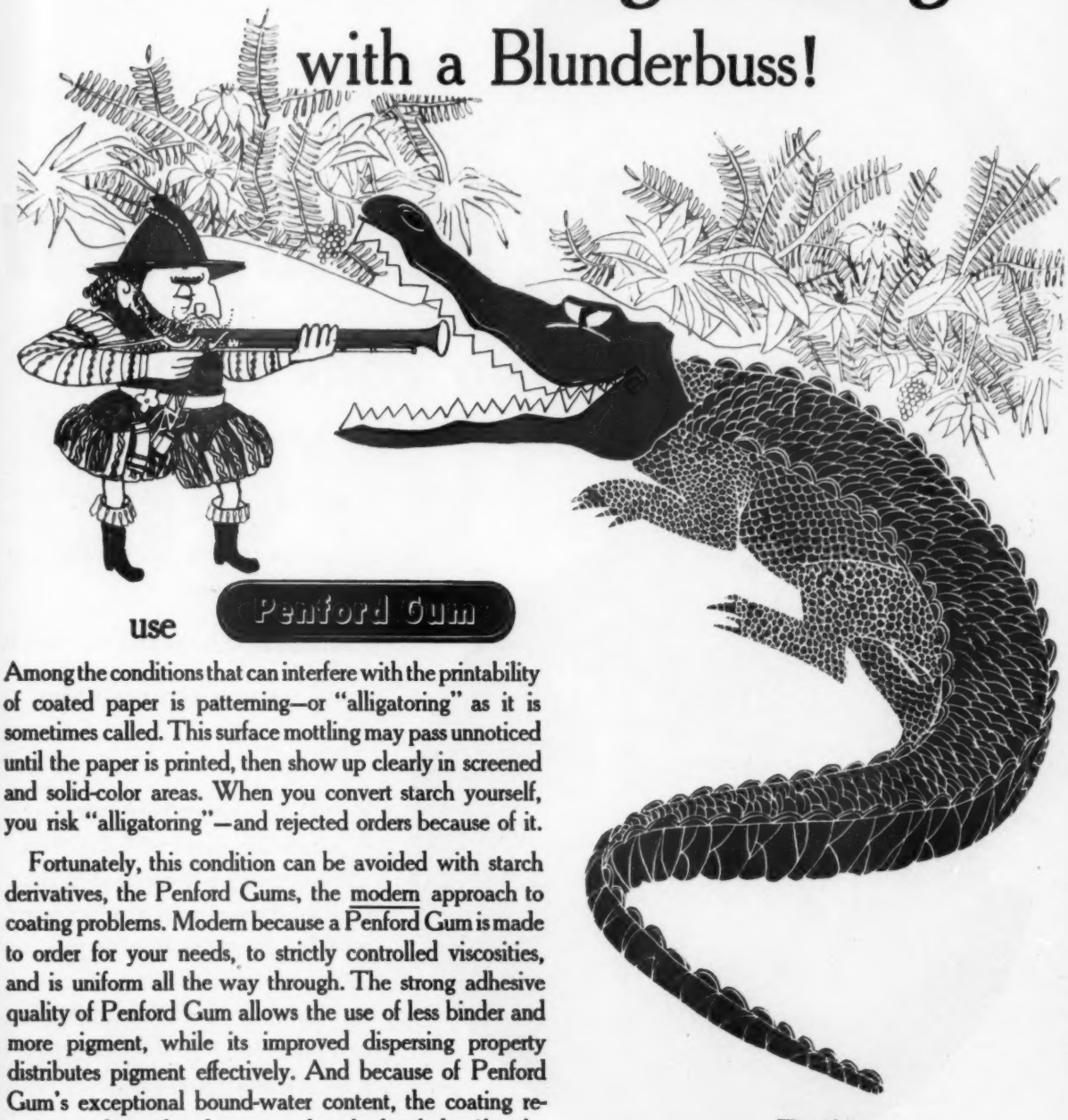
Don't Tackle "Alligatoring" with a Blunderbuss!



use **Penford Gum**

Among the conditions that can interfere with the printability of coated paper is patterning—or "alligatoring" as it is sometimes called. This surface mottling may pass unnoticed until the paper is printed, then show up clearly in screened and solid-color areas. When you convert starch yourself, you risk "alligatoring"—and rejected orders because of it.

Fortunately, this condition can be avoided with starch derivatives, the Penford Gums, the modern approach to coating problems. Modern because a Penford Gum is made to order for your needs, to strictly controlled viscosities, and is uniform all the way through. The strong adhesive quality of Penford Gum allows the use of less binder and more pigment, while its improved dispersing property distributes pigment effectively. And because of Penford Gum's exceptional bound-water content, the coating remains on the surface long enough to be leveled uniformly.

These are just a few of the reasons why you get stronger, more even coatings with Penford Gum and hence greatly improved printability in your sheet. One of our technical service representatives will be glad to come to your plant to show you how Penford Gum can help you improve your paper without increasing costs. Call or write Penick & Ford today.

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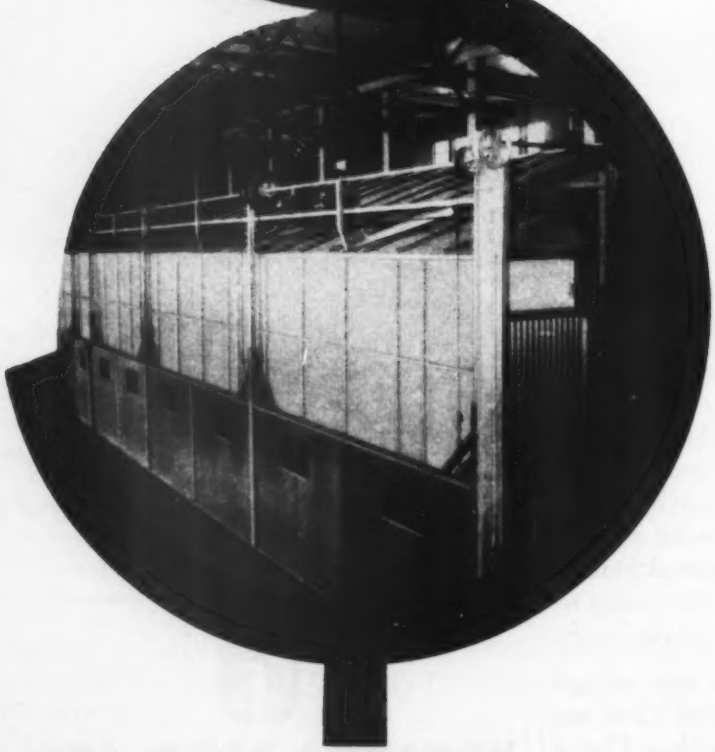

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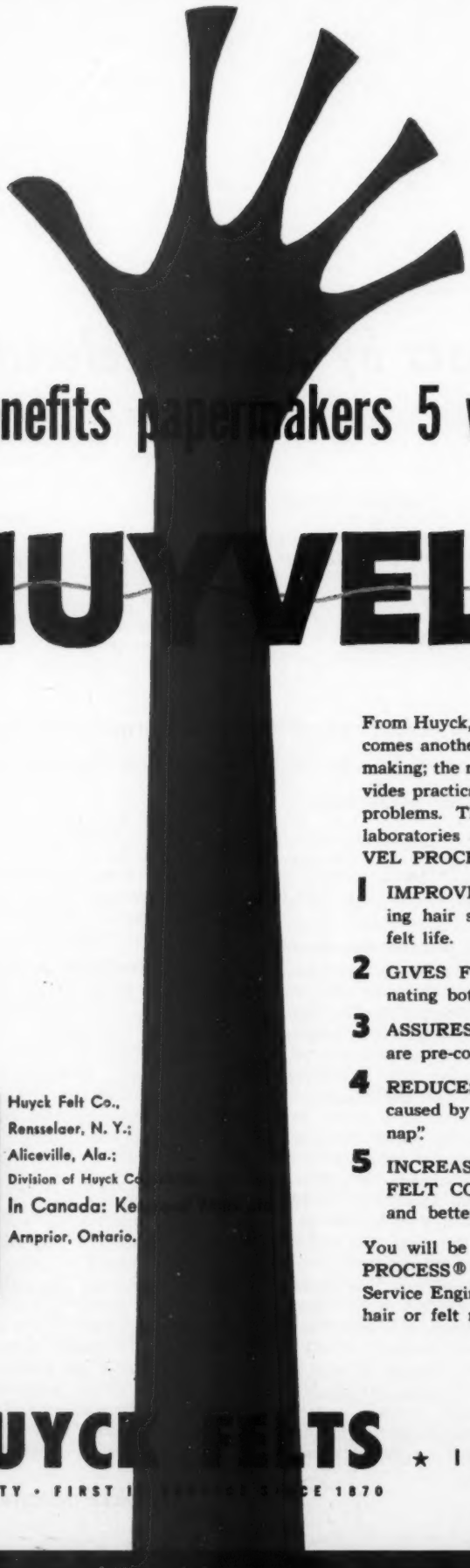

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Feature articles

Reducing mill costs by planning electrically

JOHN B. COTTELL

Chairman of the Board of Directors
Continental Electric Equipment Company

The efficient use of electrical energy may be a means of reducing power bills by 10-20 per cent and operating costs by an even greater percentage.

IN OUR competitive economy, the mill's high cost of labor and materials must be offset by improved quality and mechanization. Often a first step is necessary, which is the planning of an adequate electrical program.

The efficient use of electrical energy has an important bearing on every part of the mill's operations and may be in itself a means of making substantial cost reductions. In many instances, reductions of 10 to 20 per cent may be made in power bills, while much larger reductions may be effected in operating costs.

Electric power is one of the few elements in mill operation the costs of which have been reduced in recent years. Over a 20-year period in all of industry, the costs of labor increased 316 per cent, construction 293 per cent, raw materials 250 per cent, and industrial coal 220 per cent, while the cost of electric power purchased from public utilities decreased 30 per cent.*

*From figures supplied jointly by the National Industrial Conference Board and a Mid-western power utility.

There are a number of ways in which the planning of electrical facilities can cut mill costs.

New product development

It is widely recognized that no group more than the paper industry has made progress through an imaginative, resourceful development of new products and new product uses. Hundreds of new paper products have made their appearance in the home — on the dealer's shelves in the form of attractive packages — in the factory shipping room — and in the construction industries. Yet such a development of new products had to be planned for electrically. Adequate power facilities had to be provided well in advance of actual manufacture.

In order to keep abreast of competition, the mill needs a reserve of power. Although it is true that much of the newer machinery actually requires less power because of improved anti-friction bearings, nevertheless the trend is strongly toward greater production through higher operating speeds, and toward a rapid expansion of production facilities. In most mills over a 10-year period there has been a heavy increase in horsepower consumption per ton per day.

Quality of product

In the mill's control of product qualities, electric power is playing a role of increasing importance. Among others, the factors of incoming stock, water, speeds of machines, humidity, temperature, and at times manual dexterity all must be closely controlled and coordinated.

Of the many elements that enter into paper making, electrical energy is one that can be precisely controlled. However the mill's electrical system must be carefully and adequately planned if this control is to be achieved. The efficient operation both of motors and also of many electrically operated control devices depends to a material degree on a precise control of the voltages that are supplied.

To an increasing extent, the unit substation type of power transmission is being used by many paper mills. Power is purchased from the utility

or is supplied by the mill's generator in the medium voltage range (up to 15000 volts), and is stepped down in the transformer sections of the unit substations to the voltages required in various segments of the mill's electrical system.

One of the advantages of this type of power transmission is the close control of voltage level which is made possible by the adjustment of a series of "taps" in the transformer section of the unit substation.

A second important benefit that is derived from unit substation operation is the purchase of power in the medium voltage range at a "wholesale" rate. As a rule this is much lower than the rate for low voltage power. It is true that allowance must be made for the cost of maintaining the unit substation — or substations. However the net savings may amount to as much as 15 per cent of the entire power bill.

Minimization of mill "down-time"

One of the most important ways in which adequate electrical facilities cut costs is through the minimization of mill "down-time". The paper industry is one that is known to require an unusually heavy investment in plant and equipment. Continuous production is needed in order to make this investment yield a profit. "Down-time" in mill operation can never be made up through "over-time", as is the case in other industries.

One of the chief problems in planning a mill's electrical system is that of providing adequate standby service without too great an investment in electrical facilities. The draw-out switch, is a good example of how modern electrical design cuts costs. Switch and fuse are mounted on a removable truck. In the event of a blown main fuse, or a fuse protecting the system of an entire department, the operator withdraws the truck, refuses the switch in a location that is completely removed from any possible contact with a live line or part, replaces the truck in the cubicle, and — as soon as the fault has been cleared from the line — he can reclose the circuit. The above steps can be performed by one man in three minutes or less. The electrician, meanwhile, is fully protected.

Protection against fault currents

One of the most important ways to save money through adequate electrical planning relates to a phenomenon known as fault current. A fault current is a tremendous surge of current that comes in from the power utility's lines or from the mill's generators when a short circuit occurs, and as a result a major part of the electrical system is suddenly "shorted out". A fault current may be of such intensity that unless interrupting devices of adequate capacity have been installed, the electrical equipment may explode, causing loss of life or a disastrous fire. Many industrial plants have been completely destroyed by fire as a result of inadequately interrupted fault currents. The risk from fault current increases year by year. This happens whenever the power utility or the mill's power station expands the power distribution facilities. The power utilities are being called upon to approximately double their facilities each ten years while many mills, too, are progressively expanding power-wise.

Timing of operations

Effective electrical planning is a boon to the production engineer who lays out the mill's floor plan, for it means that plug-in power outlets are available wherever they are needed. The result is that, without excessive costs or delays for new wiring, all machines and equipment units can be placed in the best locations. In this way material savings are made possible in production time.

Of related importance is the conserving of valuable floor space by placing machines and equipment in the most favorable locations. In most mills that are planning for additional automation this can mean a large dollar savings.

Isolation of machine and process controls

An important factor in electrical planning is the housing of machine controls in such a way that unauthorized persons are prevented from tampering with them. This may be accomplished by housing motor starters and process controls in suitably enclosed motor control centers. The cubicle units of the motor control center may be locked, or the installation may be in an area prohibited to operating personnel.

An additional advantage is gained in that the enclosure may be such as to protect the control wiring against moisture, or infiltration of grit particles.

Correct electrical design can also play an important part in the lowering of maintenance costs. When equipment is easily and safely serviced, the maintenance electrician spends more time in preventing trouble, and less in making repairs.

How to gain full benefit from electrical planning.

The best answer to this question is in a careful organization of the power planning function: (1) making available to the plant engineer the services of men who have had a specialized yet broad experience in planning of power systems; (2) making use of modern methods for analyzing and financing equipment-replacement needs.

In a day when good engineering talent is hard to come by, there is even more than the usual justification for retaining a competent electrical consultant. The professional man is valuable to have in regular consultation because of his objective point of view, and because of his breadth of experience in power distribution problems.

Other valuable members of the plant engineer's team are the electrical contractor and the representative of the area's power utility. The latter is especially useful in suggesting ways to use power more profitably inasmuch as he is interested in increasing power sales, and hence in helping his customers save money.

Value of a formal equipment-replacement program

One of the most significant recent advances in management methods is to be noted in the steadily increasing number of companies that have organized equipment-replacement programs.

This development has been due in no small part to the work of The Machinery and Allied Products Institute, which has pioneered in scientific method of analyzing replacement needs. Surveys made by MAPI in 1948 and again in 1956, for example, revealed that in 296 representative companies the number "vesting specific responsibilities for equipment studies in a particular individual or staff" had during this period nearly doubled — an increase from 28 per cent in 1958 to 54 per cent in 1956.*

Such a development has doubled significance when the need for modernized electrical systems is considered:

(1) An organized program for replacing obsolete machines and equipment is pointless unless adequate power facilities have been provided. To an increasing extent, the new machines and equipment that are appearing so rapidly on the market require more power than do the older models. Never has there been such a rapid advance in the science and arts of manufacture. The machines installed today are vitally needed to maintain this na-

*The Management Review, April 1957, pp. 24-25.

tion's competitive position, — and adequate power facilities are needed in order to use the new machines.

(2) The best way to determine whether a modernization of the existing power system is needed is to make a formal equipment study. Preferably this will be carried out with the help of an electrical consultant, so that the point of view expressed will be removed from internal bias. The method for making such a study follows closely the one that has been so effectively developed by The Machinery and Allied Products Institute. Certain short-cuts have been instituted which make the method easier to apply.

In applying this or any other method of replacement analysis, it is suggested thought be given to an accompanying method of providing the funds needed to purchase new equipment, when needed. This can by the means of assuring that, at all times, the most modern equipment will be readily available, and therefore that the company's competitive position will be maintained.

It is logical that a plan to accumulate funds for this purpose be related directly to sales volume. Modern, high-speed and high-precision machinery is needed to produce today's goods, and it is appropriate that the benefits to the customer will be reflected in selling price. A levy of part of an increased selling price for the purpose of maintaining an equipment-replacement fund assures continued high grade service to the customer.

When to modernize?

The method which is recommended for determining whether it is profitable to modernize an extisting electrical system is as follows:

(1) A survey is made by affected departments to determine estimated savings from an improved system. These savings are expressed as reduction in operating costs for the volume of manufacture anticipated in the coming year.

(2) Costs of operation as at present are projected for the same period and for the same volume of manufacture (without benefit of the savings as estimated under 1).

(3) The costs of ownership of the existing and proposed systems are calculated and compared (including costs of installation, scrap values, allowances for depreciation, interest on invested capital and taxes).

(4) Savings for next year following modernization are expressed as the difference between the net operating cost favoring the new system and the net capital cost favoring the present system.

All of the savings shown by this method are for next year only. It is important to note that for the system now in service, the next year sum of its operating inferiority and capital cost is at its lowest. Each year thereafter the imperfections and inferiorities of the present system will increase.

It should be pointed out that investments in modernized equipment usually have an important by-product result in tax-savings. Keeping cash in the business in the form of improved equipment tends to reduce net profit, and therefore less money is dissipated in the form of taxes. Some companies have a practice of measuring the savings from a plant modernization after taxes. Such a practice, it is suggested, is not a realistic one. With new equipment tending to cost more than did the replaced equipment because of changes in the value of the dollar, and with money for new equipment more difficult to "find" because of present federal tax depreciation methods, it is exceedingly important that a sound position be taken with respect to keeping the plant abreast of competition. It is dangerous to hold an "umbrella" over out-moded equipment.

A savings before taxes is suggested as a truer measure of the value of an investment in modernized equipment — an investment that both tends to reduce taxes because it diverts money from net profits and also stabilizes the company's position for earning profits.

Questions in connection with system modernization

Some of the questions to be asked in making a survey of needs for system modernization are:

Production engineering and sales departments

(1) What new or improved products are planned, the manufacture of which will require machines or processes using more power than at present?
  (a) What will be the overload, if any, on existing power facilities?
  (b) What will be the estimated increase in profits from the sale of new products, net after deducting increased power costs of operating the new equipment?

(2) What net rate-savings due to higher power factor are possible through a reallocation of motors by correct speeds, sizes, and types?
  (a) Are all required motors in the plant now?
  (b) What will be the net savings from required new motors after consideration is given to increase or decrease in operating costs?

Production planning department

(1) By manufacturing departments, what reduction in production time will be possible through addition of power outlets, so that each machine and process unit can be used in its most favorable location?
  (a) What will be the net savings through resulting reductions in the manufacturing cycle, after deducting costs of maintaining the new facilities?

(2) Can savings be made in power bills by equalizing power loads (by shifts or by periods within a given shift)? It so, what will be the net savings after deducting higher payroll and other costs necessitated by extra shift operation?

(3) What net rate-savings due to higher power factor are possible through use of additional capacitors and/or synchronous motors?

(4) What will be the estimated net savings from providing adequate stand by facilities, so that in the event of a power break, service can be continued with minimum loss of production time (net after considering use-and-occupancy insurance payments,* and after deducting costs of maintaining the new facilities)?
  (a) What figure should be assigned to protection against future increases in use-and-occupancy insurance rates? Modernization of power facilities may not result in a decrease in present rates to be increased.

Manufacturing department

(1) In view of anticipated increase in manufacturing schedules over the next few years, what will be the additional requirements for power such as will make possible the operation of all machines and equipment at maximum efficiency

*Payment from use-and-occupancy insurance may largely or completely offset losses of production time, however they cannot be expected to offset losses in customer good-will due to delays in filling orders.

at all times (including periods of peak loads)?

(a) What figure should be assigned to net savings from this source (net after deducting costs of maintaining required additional power facilities)?

(b) What figure should be assigned as savings from improved, safer working conditions (including benefits in improved morale of supervisors and operators)?

Plant maintenance

(1) What figure should be assigned to the savings resulting from adequate protection of plant and personnel against fire and shock hazards?

(a) Savings in insurance rates are possible but not probable.

(2) What net savings are possible through purchase of current of higher voltage than at present?

(3) What will be the estimated savings through lower costs of maintaining new power facilities of improved design?

Calculation of next year's savings

Next year's savings can be calculated by an equation derived as follows:

Supposing, the sum of savings from all sources = A

Costs of plant operation for next year's anticipated manufacturing volume under existing power system = B

Costs of operation for next year's anticipated manufacturing volume with modernized system (B − A) = C

Costs of ownership of modernized power system = X (include purchase price of new power facilities less scrap values of replaced equipment, depreciation allowance for modernized system, interest on invested capital required for same, and taxes on same)

Costs of ownership of present system = Y (includes comparable factors to those above)

Net savings from the modernization of a power system = C − B − (X − Y).

It should be emphasized again that the savings indicated by this method are for next year only. Each year thereafter it is logical to expect these savings to increase, for the reason that the new elements of the modernized system will be subject to a less rapid rate of obsolescence than would be the replaced elements.

Whatever methods of depreciation are used for tax purposes — whether this is the straight line method, the declining balance method, or the sum of the digits method — it is suggested it will be well to figure depreciation allowance realistically in terms of the estimated productive life of each major element in the modernization program. This probably will result in calculating a faster rate of depreciation than is allowable for tax purposes; however, it will be a more valuable expression of actual depreciation, for the reason that rapid advances in the technology of power equipment design have made obsolescence a far more significant factor than is the rate of normal wear and tear that we usually associate with the term "depreciation". The savings indicated for the modernized power system accordingly will be less, and by the same token the savings estimate will serve as a more conservative, and hence as a more valuable basis for planning.

It is true this method for determining the profits to be realized through a modernization of the power system sheds no direct light on two questions, namely:

(1) For what rate of plant growth should the system be planned? and

(2) Over what span of years should the system be expected to function?

It is safe to say, however, that these questions will not be the more difficult to answer because of the effort expended in making the plant survey.

Acid-modified flour found suitable for paper sizing

ACID-MODIFIED wheat flour has proved equal in laboratory tests to commercial sizing material for imparting strength to paper, the U. S. Department of Agriculture reports.

In tests at Northern Utilization Research and Development Division of USDA's Agricultural Research Service, Peoria, Ill., some papers sized with modified flour gained 43 per cent in bursting strength, 20 per cent in tensile strength, and 93 per cent in folding endurance.

Papers treated with modified flour size were comparable to papers treated with widely-used commercial sizes in brightness, opacity, freedom from discoloration, and other desirable properties.

Successful chemical modification of wheat flour by reacting it with ethylene or propylene oxide was first reported by ARS in June, 1959. It was found that these chemically modified flours mix readily with water to form a free-flowing paste, a quality desirable in industrial paper making. Northern laboratory chemists also reported that chemically-modified flour could be stored with a moisture content of 5 per cent or less.

On the basis of recent performance tests with laboratory-scale equipment, it is expected that at least one of the acid-modified flours will perform satisfactorily in high-speed paper making machines, according to utilization workers at the Northern Laboratory.

Acid modification is the latest development in efforts to adapt flour as a paper size. It is a dry process, which can be applied to the chemically modified flours previously developed. Acid-modified flours have lower viscosities with high concentrations of solids than those that have not been acid-modified—an industrially desirable improvement.

Acid modification is carried out at low temperatures, and processing materials are inexpensive. It consists of treating dry flour with small quantities of acid at 77° to 95° F. for one to eight hours, and dry-blending the product with an acid neutralizer for two hours.

Northern Laboratory scientists believe that if modified flours are introduced into the paper-making industry, substantial new markets for wheat could develop. Their interest in wheat flour for this purpose is based on: (1) availability of flour as a raw material in large quantities at relatively low cost, and (2) broad industrial potential of a material that combines starch and gluten, both valuable for adhesive qualities.

Rheology and the paper coater*

WILLIAM R. WILLETS

Titanium Pigment Corporation

Part II — Raw materials, color preparation, coaters and properties of the finished sheet.

THE FOLLOWING discussion will attempt to point out some of the rheological considerations encountered in the preparation of colors, their application on various types of equipment, and the properties of the finished sheet.

Raw materials and color preparation

Probably there is no phase of paper coating that has been more thoroughly investigated from a rheological viewpoint than that of clays, calcium carbonates and other pigment raw materials. The literature on this deals not only with paper coating specifically but also represents much fundamental work. Space does not permit a detailed review and the reader is referred to the various editions of the TAPPI Bibliography (29) if he wishes to pursue the matter. Rheological information is also given for most of the pigments discussed in the TAPPI Monograph Series No. 20 "Paper Coating Pigments".

Viscometry is a very useful and easy means of determining the dispersant requirements of a pigment when slurried in water, (30); all other things being equal, the optimum amount of a dispersant will produce minimum viscosity. Such an optimum will depend on the pigment and dispersant in question, total solids of the slurry and the water involved. TAPPI is considering a standard procedure for this property and already has a method for testing the viscosity of a coating clay slurry which is also applicable to other pigments (31).

Adhesives, naturally, are subject to rheological consideration and suppliers of the many types of converted starches usually classify those in a particular class (dextrinized, oxidized, chlorinated, etherified, etc.) on the basis of viscosity. Viscosity has long been prominent in the starch field and there are several well recognized methods for its determination (32). If a paper coater converts raw starch in the coating plant by using an enzyme, viscosity control of the conversion is very important and continuous control may be used (33). Caseins, isolated proteins and glues are of course all considered on the basis of their rheological properties, as discussed under the pertinent chapters in TAPPI Monograph Series No. 9 "Proteins and Synethetic Adhesives for Paper Coating" (at present being revised). ASTM Committee D25 is considering a method for determining the basic viscosity of caseins and isolated proteins, which will be dependent on a rigid procedure for solubilizing. Methods of solubilizing and the alkalis used have an effect on the viscosity of casein solutions; caustic soda and ammonia are usually considered as giving the lowest viscosity, soda ash somewhat higher, and borax and trisodium phosphate still higher. Sodium silicate gives very high viscosity as does calcium hydroxide. Frequently a combination of two or more alkalis is used. With the exception of ammonia, viscosity was reported to be higher at pH 9 than at pH 8 (34). One of the advantages of latex emulsions is their low viscosity at high solids which permits higher total solids for the final color. Latices are usually used in conjunction with other adhesives.

Several methods for preparing color are described in TAPPI Monograph No. 11 "Preparation of Paper Coating Colors" (at present being revised). A very common procedure is to make a high solids water slurry of pigment using suitable dispersants which is then mixed with the vehicle. In preparing the pigment-water slurry simple high speed mixers such as the Lightnin', fluid energy mills such as the Cowles, Hockmeyer, and Kady and colloid mills represent common types used. Pug mills and other kneaders are used for plastic pigments such as clay but are not generally applicable to pigments such as titanium dioxide. Ball mills are still occasionally used for critical colors. High shear viscosity measurements may prove of real importance in indicating whether or not a slurry will handle on a specific piece of equipment; for example it has been found that high solids slurries frequently can be mixed with a simple high speed

*This article is a condensation of a paper presented at a symposium which was sponsored by the Cleveland Society for Paint Technology, the Cleveland Paint, Varnish and Lacquer Association and the Case Institute of Technology, Cleveland, Ohio, in September 1959. The complete paper was published in May 1960 issue of the Official Digest of the Federation of Societies for Paint Technology and this condensation is published through the courtesy of the copyright owner.

stirrer but become so dilatant under the conditions of a Kady mill that it becomes inoperable.

Another method consists of slurrying starch and pigment together at high solids and then converting the starch by enzyme action in the presence of the pigment (35). Viscosity measurements are important to indicate when the conversion cycle is complete and in some instances the conversion can be controlled automatically by means of continuous viscometry. Similar methods are used with casein and isolated protein; here the pigment and uncut adhesive are slurried together and the casein or protein alkali cut in the presence of the pigment.

Another method in common use where high solids coatings are required consists of adding the pigment to a portion of the prepared adhesive in a heavy duty, high shear mixer. After dispersion is complete the mix is let down with the balance of the adhesive, which may consist largely of a latex emulsion, and is finally diluted to the desired solids for application.

In addition to the major components of pigment and adhesive, a color contains other additives some of which are primarily designed to alter flow properties. For years, soaps have been used as levelling agents. Sodium oleate was originally the most common but now sodium and ammonium stearates, metallic soap dispersions, fatty acid esters and sulfonated oils are all used. In the case of starch coatings such surface active agents tend to form thixotropic complexes with the amylose. Bodying agents such as the alginates, sodium carboxymethylcellulose, methyl or ethyl cellulose, natural gums such as guar and locust bean, and borax solutions are all used as flow modifiers. Fluidifiers include such materials as dicyandiamide and its soluble salts, urea, acetamide, thiourea, and thiocyanate salts. Sulfonated naphthylene and polyoxethylene are reported to be viscosity stabilizers. Other additives — defoamers, plasticizers, wax emulsions, etc. — all have an effect on viscosity. The use of latex emulsions with their fluidity at high total solids (as compared to starch, casein or isolated protein solutions) usually permits the attainment of higher total solids colors at operable viscosities.

The above comments, since they deal with flow properties and methods of modifying them, indicate the importance of suitable viscometric control to assure color uniformity. Proper, uniform rheological properties are essential for optimum operability but suitable properties may vary from one type of coating machine to another as will be evident when some of them are considered. Many types of coating machines are described in TAPPI Monograph Series No. 8 "Machinery for Paper Coating" (now being revised).

Coating machines

Since it was the development of coating on the paper machine which brought the importance of rheology into sharp focus, examples of such equipment, as surveyed by Boothe (36), will be primarily considered. The various methods were the basis of a symposium at the TAPPI Coating Conference in 1957 (37), where the advantages and disadvantages of each were discussed.

The many variations of size presses being used as coating heads are essentially simple roll coaters with all the inherent problems of patterning resulting from improper rheological characteristics of the color. These may not be too evident because the nature of the equipment calls for low total solids which may appear "fluid" but actually be very thixotropic or dilatant.

This tendency to pattern together with other limitations imposed by low total solids resulted in the application of printing press principles to coating machines. Such equipment may operate with total solids of 65 per cent or higher on webs of 16 ft or wider and at speeds upwards of 1700 fpm.

There are many types which might be classified as "letter press print roll coaters". In general the coating color is split between squeeze roll nips just as a printing ink is on a letter press. There are many variations in the number of rolls, their diameters, their composition, oscillation, differential speeds, etc. Some types use reverse rolls to eliminate the pattern on the applicator roll. Many combinations and modifications have been used with the prime purpose the laying down of a suitable weight and type of smooth coating free from patterning. As has already pointed out the rheological characteristics of the material in a roll nip can have a marked effect on its behavior in that nip and its subsequent application.

For proper application on the several variations of coating heads based on gravure or offset-gravure printing the coating must be properly formulated to give release from the gravure cells. Rheological characteristics — viscosity, thixotropic dilatancy — play a part in such effective release and subsequent application.

In the air brush or air doctor type of coater the colors are usually fairly fluid. The coating follows the contour of the sheet itself rather than filling in low spots, as may be the case with the various types of roll coaters.

The trailing blade types which are becoming common can operate at very high speeds. It has been reported that flow properties may be less of a problem with other coaters and that total solids of as low as 30 per cent or as high as 65 per cent are applicable. The action of the trailing blade is not entirely clear although some think that it acts as a valve which raises a certain degree depending on the speed of operation, the viscosity of the coating color and the type of base stock. The coating does not follow the contour of the web but levels off, filling low spots. In any event, the rheological characteristics of the color still play a part.

Mention should also be made of the doctor type of coating head in which an excess of color is applied by an applicator roll and the excess metered and doctored off by means of a rod which may oscillate and rotate with or counter to the web, or by means of a blade. The total solids for such types of equipment are usually low and the colors fluid, but patterning from improper rheological characteristics may occur.

There are probably as many different sets of optimum rheological characteristics as there are different types of coating equipment, speeds, raw stocks and all the other variables. Nevertheless, while the problem of attaining such optima might seem insurmountable, even simple viscosity controls may often facilitate the suitable application of a coating under a given set of circumstances. What is best for one set of circumstances may not be best for another.

Base stock and coated sheet

Just as there is a definite relationship between paper and ink in printing there is a similar important relationship between the rheological properties of a coating color and base stock (frequently called "raw stock"). The rate and extent of water or vehicle redistribution within the wet color and into the base sheet to which it is applied obviously have an effect on the flow properties of the color at the boundary of application. This rate and extent are in turn dependent on a number of factors including the water retention of the color, its rheological characteristics, its method of application and the absorbency of the base stock. It is evident that the rheological structure and viscosity of the color and the water retention of the color in relation to the particular base stock to which it is being applied, type and speed of application, etc., must all be considered as a whole.

The water retention will be affected at the instant of application by the shear rates and forces involved, as well as by the temperature.

Any sheet of paper has definite rheological characteristics which have been and continue to be the subject of much investigation, as summarized by Rance some years ago (38). These influence the relationship of the base stock and color and also have an effect on subsequent treatment of the coated sheet. For example, the viscoelastic properties of the coated sheet will depend on the base stock and the color applied, and such properties may have a marked effect on such operations as calendering, printing, folding, etc.

These phases alone could furnish the subject for a long treatise and are mentioned in passing so that their importance may not be overlooked. It should also be noted that there are many other types of materials used for paper coatings for functional and decorative purposes, and in all cases rheological characteristics are important. Among these might be mentioned solvent coatings, including clear and pigmented lacquers, hot melts, including paraffin waxes, and extrusion coatings, such as polyethylene.

Summary

The foregoing comments should give an idea of why rheology is so important to the paper coater, and some of the many problems involved. The old types of measurement, while adaptable to the low solids and slow speeds of the past, are probably rarely suitable either to the high speed, high total solids operation of today nor will be to those of the future. (Two new types of coaters which may well require new rheological concepts were described at the 1959 TAPPI Coating Conference).

Except as a means of simple control, single point viscometry is rarely a satisfactory method of indicating whether a color is operable. High shear, multipoint viscometry, with its indications of thixotropy and dilatancy, is of far greater value. Nevertheless, it should be remembered that even such measurements are limited by the upper shear rates of any given instrument. Correlation of such shear rates with those of a given coater is also a complex problem. (The approximate rate of shear, for example, for roll coaters has been estimated to be in the order of 10^4 to 10^6 reciprocal seconds). There is in all probability an instant change in the rheological characteristics of a color at the boundary of application dependent on its basic structure, flow characteristics, and water retention (which in turn is related to the properties of the base stock), and changes in shear conditions and temperatures. All of these are so closely related that consideration of one apart from another does not offer a ready solution as to whether a color is operable, even if such consideration were possible. On the other hand, the development of an instrument which would include all the many variables (even for a given color, coater and raw stock) would seem almost insurmountable.

There is an old saying in both paper and printing trades that the only way to tell whether a given sheet of paper will print on a given press with a given ink is to print it. The same applies to paper coating — in the last analysis the only way to tell whether a given color is operable on a given coater on a given raw stock is to apply it. It is equally true, however, that some of the elements of chance can be removed by thorough consideration of the variable involved. One of these variables is certainly the flow properties of the color which are measurable, even if not completely so.

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The forest industry as affected by world affairs*

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Total annual wood consumption has increased 33 per cent over the last decade and timber-short nations are engaged in ambitious forestation and reforestation programs.

THE WAR left a huge backlog of demand throughout the world and particularly in Europe. The problem we all faced in industry was mainly one of expanding productive capacity fast enough to supply this demand.

All that is over now. It has been over for quite a while but perhaps it has taken the experiences of 1960 to convince us finally. It is not just in some industries, like steel, working at 50 per cent of capacity. It is in all industries, and especially the forest industry. This year, on both sides of the border, production of lumber and plywood has had to be curtailed. Prices have fallen. In Canada, in the case of plywood, the price of our basic construction grade fell 23 per cent in the first nine months of this year.

Conditions are better in the pulp and paper industry, but even in this sphere most paper mills are operating well below capacity. What does it all mean? I am sure you all realize it means a return to normality, a return to real life, after nearly 20 years of abnormality.

Differences in U. S. and Canadian markets

Most of all it means that things have changed; and there are naturally wide differences in the way such changes are felt in Canada and the United States. Canada is, per capita, the largest trading nation in the world and products of the forest industry in Canada comprise one third of all exports.

By contrast, the United States is a huge, vibrant and diversified domestic market which consumes every year more than the total output of the U.S. forest industry. In Canada, we must look outside our country for our livelihood and compete against other forest product exporters in the world market. In the U.S., while the industry is not immune to import competition, its market is mainly in home territory, even though, in many cases, the full breadth of the continent divides producer and consumer.

But apart from these differences in the orientation of our markets, the industries in both countries have a great deal in common.

We both face the same task of keeping pace with technological progress. Changes in this field are almost continuous. The company that fails to apply science and technology to its operations will fall behind very rapidly. Research men are reporting that the next 15 years will see immense advances in these fields. Compared with the future, the past has almost been a period of standstill.

We both face the same battles with rising costs, affecting all phases of the production cycle from the cost of the standing tree at the one extreme to the cost of freight for the finished product at the other extreme. We both face the severe competition of substitute materials, metals, plastics and non-wood building materials, whose consumption every year is increasing so much faster than most of our own products.

Increased world-consumption of wood

It is most important that we become vitally interested in the developments occurring in our industry across the world. Only by close awareness can we maintain an up-to-date and realistic attitude of mind.

A most significant development is the rapid increase in the world's consumption of wood. As Dr. Egon Glesinger* pointed out at the Fifth World Forestry Congress in Seattle, in the last 10 years the world's population has risen 20 per cent but the total annual consumption of wood has increased 33 per cent—from 690 million cubic meters to 920 million cubic meters. Only in North America has the increase been slight. It is the nations of Europe, Soviet Russia, Oceania and the under-developed countries of the world that are experiencing rapidly increasing consumption of forest products.

Extensive forestation and reforestation programs

Looking around the world today, we find the timber-short nations engaged in very ambitious forestation and reforestation programs. We see

*Condensed from the keynote address at the 51st Pacific Logging Congress.

*Director of Forestry & Forest Products Division, Food & Agriculture Organization, United Nations, Rome.

the Scandinavians practicing highly sophisticated and intensive forestry; with the Swedes, according to Professor Streyffert (recently retired Dean of the Royal Forest School at Stockholm), having a forest area about two-fifths that of British Columbia and sustaining approximately one and a half times the cut of this province.

We see Russia becoming an important exporter, and driving hard for a pulp and paper expansion that would be the greatest the world has ever seen. And we see newly emerging nations, testing their political independence, possessing rich stands of hardwoods and bidding very vigorously for the capital and the technicians to develop them. Nations are striving for self-sufficiency in timber. The trend is not one to overlook, if only because each new acre that is being planted is an acre to be harvested and re-harvested in the future.

Let us take a quick look at some of these developments across the world.

New Zealand—has been planting trees at an accelerating rate for the last 60 years. Close to a million acres have been planted. The eventual target is two million acres in coniferous forest. There are enough trees ready now for thinning and harvesting to support three pulp and paper mills, a number of sawmills and plants for plywood and secondary wood products. These facilities have turned New Zealand from a net importer of forest products to an increasingly important exporter.

Australia—has a more modest target: one million acres of coniferous pine forest, largely fast-growing radiata pine. It has planted close to half of this total, and these new plantations and the continent's native eucalyptus forests support pulp and paper mills in Tasmania, South Australia and New South Wales, particle board and cardboard mills, and a lumber industry that has reached such proportions that its producers are now petitioning their government for tariff protection against foreign imports.

South Africa—has perhaps the most ambitious program of all Commonwealth countries. Ten years ago South Africa imported over 90 per cent of its pulp and paper and the bulk of its lumber. Today these positions are reversed. Ten years from now South Africa will have more than four times the amount of pulpwood ready for thinning and harvesting that she has today and it is expected that in 15 to 20 years the fast-growing plantations of pine will supply almost all of her lumber requirements. This is a staggering increase in any country, and with South Africa now exporting kraft pulp, various grades of paper and other forest products, we can only expect this trend to accelerate.

The United Kingdom—with its 50-year program of new plantations and improved management of existing stands, will bring Britain to the point where it is at least half self-sufficient in forest products. The program, which includes planting 3 million acres to Douglas fir, Western Red cedar, West Coast hemlock and Sitka spruce, is about one-third completed according to many reports. The yields are about double our own and the rotation will be about half as long.

Nor is forestation and self-sufficiency the goal of only the timber-short nations of the West. In a burst of activity that is startling to consider, the Communist Chinese in their first five-year plan ending in 1957, planted by hand 25 million acres of coniferous forests. Since then, the pace has quickened. According to a recent newspaper report, 55 million acres have been planted to date.

Russia's forest industry

In these areas, and many more, government-financed or sponsored programs are creating forests for tomorrow. Changes that are possibly even more important have been taking place in the nations that possess abundant stands of timber, but have heretofore neglected their development and exploitation due to the necessity of concentrating on more pressing problems. The greatest of these, of course, is the Soviet Union. Russia possesses some 50 per cent of the world's softwood forests, but it is only in the past few years that a real beginning has been made to develop this potential.

The Soviet pulp and paper industry has been rebuilt, the pre-war position in the European lumber trade has been recovered and improved upon. Russian logging techniques have been vastly improved by the use of a wide range of ingenious machines and pieces of equipment that we on this coast might gain much from studying.

Russian lumber has been landed on the docks of Sydney, Australia, and, to a small extent, even New York. Soviet plywood has been sold in Montreal and plywood logs in Melbourne and Adelaide. Russian pulp and paper and newsprint are feeding converting plants and presses in many Asian and African nations. It is sold at bargain prices for purposes of propaganda. It is tempting to dismiss Russian production as inferior in quality to our own. But this is not the case. Many buyers in Britain prefer the spruce from the Baltic. We, ourselves have put their newsprint through a battery of tests, and it compares favourably with our product. The Australians described Russian timber as of high quality, "suitable for mouldings."

Recently, a 10-man delegation from the Soviet pulp and paper industry toured Canadian mills. The head man, Orlov, told us of their current five-year plan that will bring about the construction of several new pulp and paper complexes each producing 1.8 million tons a year, equivalent to almost four times the production at Powell River, presently the largest single newsprint mill in the world. Pulp and paper expansion is an integral part of the Soviet's long-range expansion plans. The emphasis just now is on kraft paper and board.

Developments in other areas

Finally, a few words about the forest-rich lands of Asia, Africa and South America. Did you know that the world's largest plywood mill is situated not in Washington, Oregon or British Columbia, but at Sapele, Nigeria? That the highlands of South Vietnam contain expansive pine forests that may yield the raw material for the first pulp mill in South East Asia? That a newsprint mill has recently been constructed in Pakistan, on the vast delta of the Ganges River; and that Japan, one of the most densely populated nations on earth, expects to keep pace with its wood requirements by more intensive silviculture and the pulping of hardwood species? Looking at South America, we see pulp and paper industries in prospect for Chile and Peru, and the beginning by Brazil of the utilization of its vast forest felt that stretches along the Amazon drainage system.

Effect of European free trade blocks

There is one other trend—the development of trading blocks in Europe—to which we shall have to adjust our attitudes. The Inner Six will provide its members with an integrated market of 168 million people, within which goods, labor and capital will be able to move without restriction, as in the United States. The Free Trade Area, moving more cautiously towards such

(Continued on page 660)

T. A. Andrews demonstrates the Calculating Punch unit.

Card-O-Matic units permit faster customer billing and reporting.

Strathmore Paper uses Univac 120 computer

THOMAS S. ANDREWS

Tabulating Supervisor
Strathmore Paper Company

A FULLY integrated system of machine accounting has enabled Strathmore Paper Company not only to introduce significant clerical savings in the face of an increasing workload, but also to gain greater insight into current business activity than would ever have been possible by conventional methods.

Our New England firm, which operates four major mills and employs nearly 1,000 people, has been recognized as one of the nation's leading manufacturers of fine papers for the past 68 years. Throughout most of that history we had no reason to think of traditional manual accounting methods as anything less than adequate to our needs.

In the years after World War II, however, in common with many other companies in all industries, we became involved in a threefold problem: a rapidly increasing volume of business, an unprecedented complexity of paperwork requirements, and a pattern of constantly rising clerical costs.

We took our first step toward machine accounting in 1955, with the installation of basic punched-card machines. Since then, through the process of developing new applications and adding more advanced, fully integrated equipment as our experience increased, we have evolved what may well be one of the most successful mechanized accounting and statistical processing operations now at work in the paper industry.

Billing, sales analysis, elements of cost accounting, accounts receivable, and gross-to-net payroll computation all have become a matter of automatic routine, with profitable results.

The Kard-Veyer unit

The accounting cycle begins with the receipt in our office of a shipping statement copy, indicating that a given shipment of goods is ready for invoicing. Working from the information on this form, a clerk sets the whole accounting procedure in motion by pulling a specific group of pre-punched cards from a master file, which is housed in a push-button, electrically-operated Remington Rand Kard-Veyer unit.

The file contains customer name-and-address cards, product description cards, and price cards. Due to zone and quantity differentials, a given product item (of which there are some 2,000) may have as many as eight separate price categories, each requiring a separate master card. Assembling the correct item-and-price cards for each invoice would therefore be a time-consuming job in itself if it weren't for the Kard-Veyers, which permit the operator to remain comfortably seated and bring the right cards to her fingertips.

The Card-O-Matic unit

After pulling each master card, the clerk inserts it into a Card-O-Matic unit, touches a button, and the data it contains are automatically reproduced into a detail card for subsequent processing. At the same time, by means of the same push-button control panel, she enters manually only variable data such as order number and quantity into each reproduced item card.

Thus, the business of "pulling" the master cards is integrated with the preparation of detail cards to be used in the high-speed punched-card machines. We maintain identical master card files in two Kard-Veyers (each with a total capacity of 30,000 cards). Two Card-O-Matic operators are able to handle the card preparation job in

half the time which would normally be required.

The calculators

When the decks of detail cards have been created, they are fed into the Calculating Punch, which performs a function similar to that of an electronic computer: it automatically extends each invoice item and punches the results into the cards. Once the Calculator's work is done, the cards have only to be tabulated to produce a set of comprehensive, printed invoices that are mailed out to customers the same day.

At this point, with the billing job completed, we are ready to begin a series of automatic statistical processing routines for which all the necessary information is contained in a single deck of cards—the original detail cards that were created in the Card-O-Matic operation.

Wealth of information obtained

Each of these cards now constitutes the record of a specific sale of goods to a specific customer, including the unit price, the quantity, the extended total weight, the dollar amount of the item involved along with other data used in subsequent reporting. By mechanically sorting the cards into various sequences, summarizing and tabulating them, we can produce detailed periodic reports of current sales in terms of both pounds (weight) and dollars—by item, by customer within sales territory.

From pre-punching in the master deck, the same detail cards also contain a specific cost code. By means of another rapid run through the Calculator, in which variable cost rates are applied to the code figure in each card, we create a complete periodic cost-of-sales report for analysis by top management and accounting executives.

The wealth of statistical information contained in these cards also permits the automatic preparation of a number of special reports in depth. One such study, produced every six months, shows a listing of sales experience by individual product item, and serves to aid the Production Planning department in establishing optimum inventory levels.

Another, also developed through the use of codes pre-punched into each of the original master cards, shows the actual profit earned on each of the nine paper manufacturing machines that comprise our plant operation. And there is almost no limit to the number and variety of special one-shot reports that can be created in answer to specific requests by management.

Benefits of the system

The benefits we are deriving from the mechanized system can be readily determined in several areas. For one thing, the time consumed in our customer invoicing routine has been reduced from as many as three days (during end-of-the-week peak loads) to one, and the accuracy of the bills has been much improved.

Statistical reports are produced much faster as well as in a more comprehensive form. The four-week cost-of-sales report, for example, is now in management's hands more than a week earlier than was ever possible before.

Immediate savings in office expense include four clerical workers who formerly gave full time to the billing and sales analysis job. They have been relieved for more general office duties, in spite of a 50 per cent increase in the workload brought on by our absorption of the Keith Paper Company several years ago. Under conventional accounting methods, we would have had to hire at least two additional clerks to handle the stepped-up volume. The system can therefore be said to have saved the equivalent of six clerical salaries.

Far more significant than these savings in hours and dollars, however, is the fact we have opened a new concept in effective management control. In the paper business, as in any other, continued leadership depends to a great extent on management's ability to be closely and continually informed on the facts which serve as the basis for decisions.

Forest Industry

(Continued from page 658)

complete integration, nevertheless offers the prospect of a market of 75 million people for its member nations. The two areas combined, together with some other European nations which must inevitably be drawn into one or the other of these groups, comprise an economic force of some 300 million people. Compare this market with the combined total population of Canada and the United States of approximately 200 million people.

It is most urgent for us to appreciate the changing attitudes that these trading blocs represent. Following the war, the threat of Soviet aggression was felt so strongly by the Western powers that we combined our forces in the organization known as NATO. On the continent of Europe, so much closer to the Iron Curtain, this was not felt to be enough. A similar threat was sensed in the economic sphere, so great in fact that nations like France, whose traditions of tariff protection and isolation go back some 300 years, changed this attitude almost overnight for the sake of the stronger and more efficient economy that results from removing restrictions on trade.

Are we in North America sufficiently alive to world trends to adjust our attitudes with such rapidity and realism? Or are we still clinging hopefully to the "I'm all right, Jack" philosophy of the post-war years?

Looking at the long-term, if we keep ourselves alert to new developments and new ideas, there is no doubt that, given a period of peaceful progress in the world, our industry has a tremendous future. In the meantime, we are living in the present and face the immediate future. This is not going to be so easy. We can prosper though, if we rid ourselves as soon as possible of the attitudes of the last 15 years.

To sum up specifically the prospects of our industry, we have some powerful forces acting in our favor and some that are acting against us.

The factors in our favor add up to the fact that we have wood and the world wants wood products. The factors working against us add up to the fact that, while the demand is growing, other countries and other industries are making every effort to supply it.

The common market — for or against us?

We have seen a steady movement towards freedom of trade in the last 20 years. I am sure that the economic good sense of this policy will eventually eliminate all tariff barriers throughout the world, just as such barriers were removed as between the original 13 States of the Union, thereby setting the stage for the development of the highest standard of living the world has ever seen. But while this trend is developing, we will be faced with disruptions to, and distortions of, existing trade patterns. If we face up to them with enlightened good sense, looking at world affairs with a broad, global state of mind that subordinates narrow, short-term and sectional interests to the common good, I am sure that in the long run we will gain. But if we go back to the pre-war idea that the world is a big place in which we can afford to ignore everyone else, we will have put ourselves on the road to economic suicide.

Cut steam costs by varying back pressure

E. J. OLINSKE
Project Manager, Specialties
Cochrane Corporation

ONE WAY in which any steam user can keep costs down is by simply varying back pressure to meet cyclic needs. Attention to this detail, which is often overlooked, pays off in worthwhile savings.

A recent case history illustrates how quickly savings mount up by varying back pressure to suit actual operating needs.

One company ran a 500 hp steam engine at 185 psi with exhaust at a back pressure of 10 psi. Theoretical steam consumption curves indicated a theoretical steam consumption for the engine of 16.0 lb. per hp-hour, based on 100 per cent efficiency.

At certain times throughout the day, 10 psi back pressure is used for plant heating and processing. At other times (noon and night) such high back pressures are not needed. During these periods, a back pressure of 0 to 1 psi is adequate.

Reference to steam curves showed the company's engineering department that by reducing the back pressure from 10 to 0 psi, they could cut steam consumption from 16.0 to 13.5 lb. of steam per hp-hour. This would mean a reduction of 15½ per cent.

These figures were based on a 100-per cent efficient engine, but the company's engine was only 70 per cent efficient. Actually then, its steam consumption at 10 psi back pressure was 22.9 lb. per hp-hour (16.0 divided by 0.7). With back pressure reduced to 0 psi, steam consumption would be only 19.35 lb per hp-hour (15½ per cent less). This difference of 3.55 lbs per hp-hour represents savings that result from reducing the engine back pressure from 10 psi to 0 psi.

They found that the back pressure could be reduced from 10 to 0 psi for five hours of each operating day. (500 hp) × (5 hours operation) × 3.55 lb/hp-hour steam saved) × (250 operating days per year) equals 2,218,750 lb of steam saved per year.

The cost of steam in this plant averages about $.75 per 1000 lb which brings the annual savings to $1,664.00 — simply by varying back pressure to meet changing needs.

Chain-driven multiport back-pressure valve located on roof of building is adjusted by operator on ground floor of plant below. By reducing back pressure daily, the company saves more than $1,600 a year.

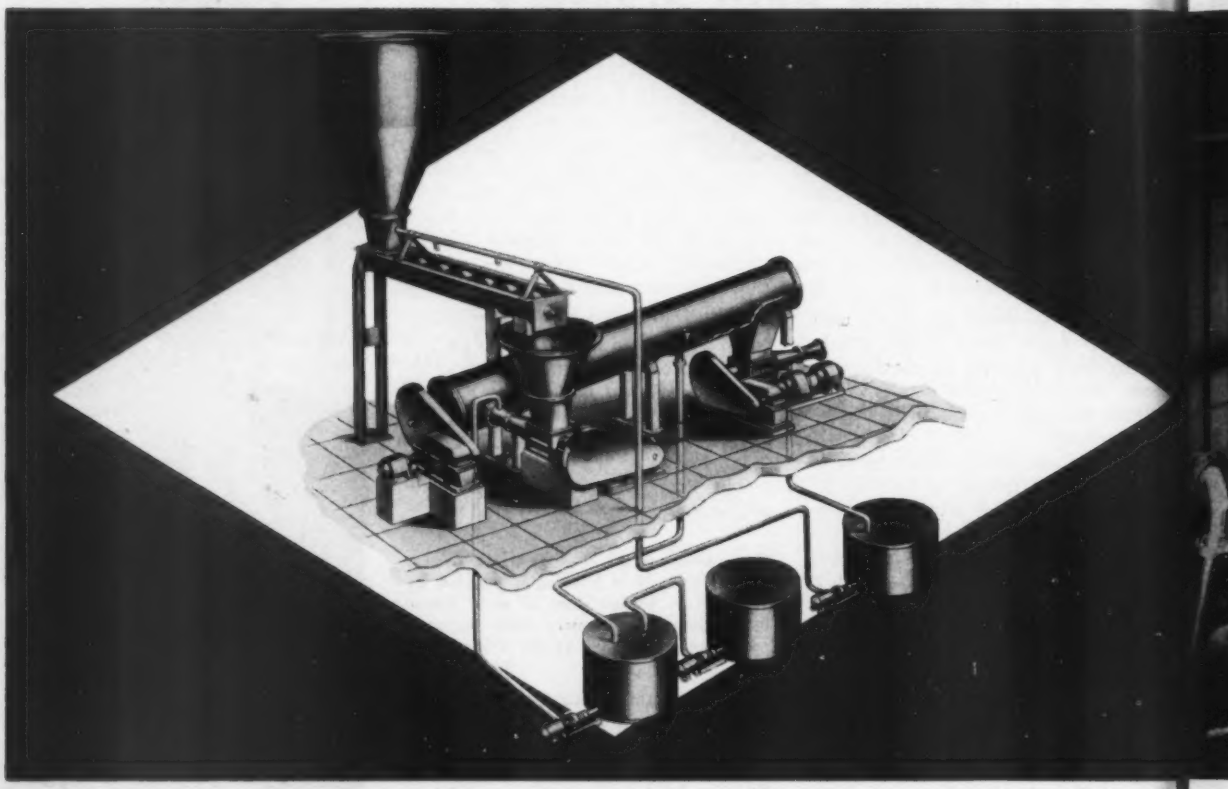
Previously, the company used a weight loaded back-pressure valve. However, pressure could not easily be changed with this valve, and as a result, back pressure was always left at the maximum setting.

To overcome this problem they installed a multiport valve, provided with a handwheel for quick, easy back pressure adjustment. Equipped with 10-lb springs, it is set to relieve at 10 psi pressure under normal operation at which time it is capable of passing up to 11,500 lb/hr with a pressure rise not exceeding 2.0 psi above the initial setting. During the rest of the day it is adjusted to wide open position affording practically 0 psi back pressure.

Since the multiport valve uses spring-loaded cushioned discs, it opens gradually and only enough to pass the exact excess steam load. In contrast, the former pop-wide-open valve wasted a considerable amount of steam every time it opened.

you're invited to come t m

the PANDIA ChemPreg*



The ChemPreg Cold Soda System is a two-stage, low power process involving

1. The treatment of wood chips or other fibrous materials with a relatively strong alkaline agent, usually caustic soda, at room temperature with induced penetration.
2. Subsequent defibering by mechanical action.

ChemPreg Cold Soda Pulping offers these advantages

1. Use of locally available hardwoods, waste wood or agricultural fibers.
2. It can replace higher priced groundwood pulp or chemical fiber.
3. Low installation cost per ton of pulp—no steam plant needed.
4. Compact system can frequently be added to existing pulp mill without modifying the building.
5. Flexibility—makes a great variety of pulps just by varying conditions.

Applications: Supplements filler pulps, groundwood and chemical hardwood pulps. Is used in news, printing, tissue, toweling, food and other boards, corrugating medium, insulating board and other grades.

*Trademark

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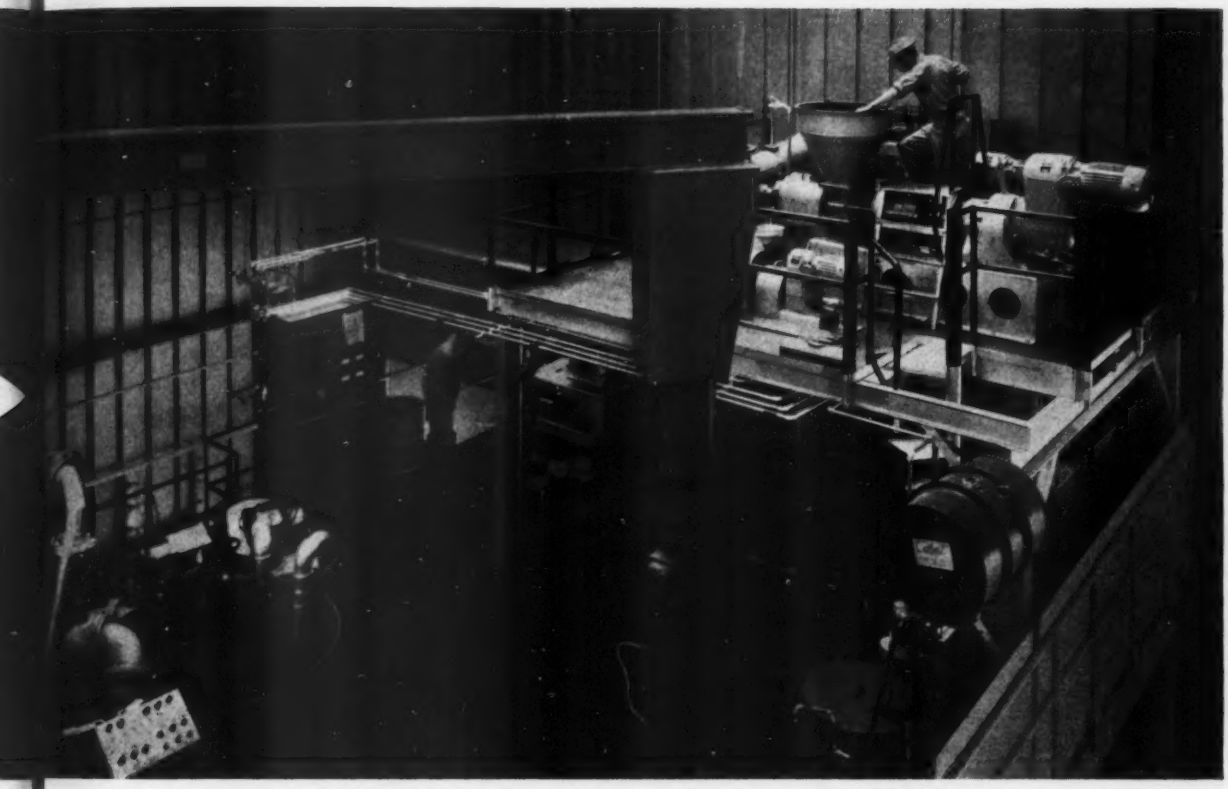
middletown, ohio, and investigate

COLD SODA PULPING *System*



ChemPreg PILOT PLANT

This new one ton ChemPreg pilot plant system, located at the Black-Clawson Research Center in Middletown, Ohio, is used to duplicate and evaluate results which can be obtained in a commercial installation. The pilot plant is available to you for demonstration or for test work on your own pulping problems.

We invite you to visit us, make use of this pilot plant facility and learn how ChemPreg Cold Soda can benefit your company. To make arrangements please contact:

The Black-Clawson Company
Pandia Division, Middletown, Ohio— GArden 2-4561

Bulletin PC-22 describes, illustrates the Pandia ChemPreg System. Write for a copy today.

Co-ordineered Pulp Mill Equipment

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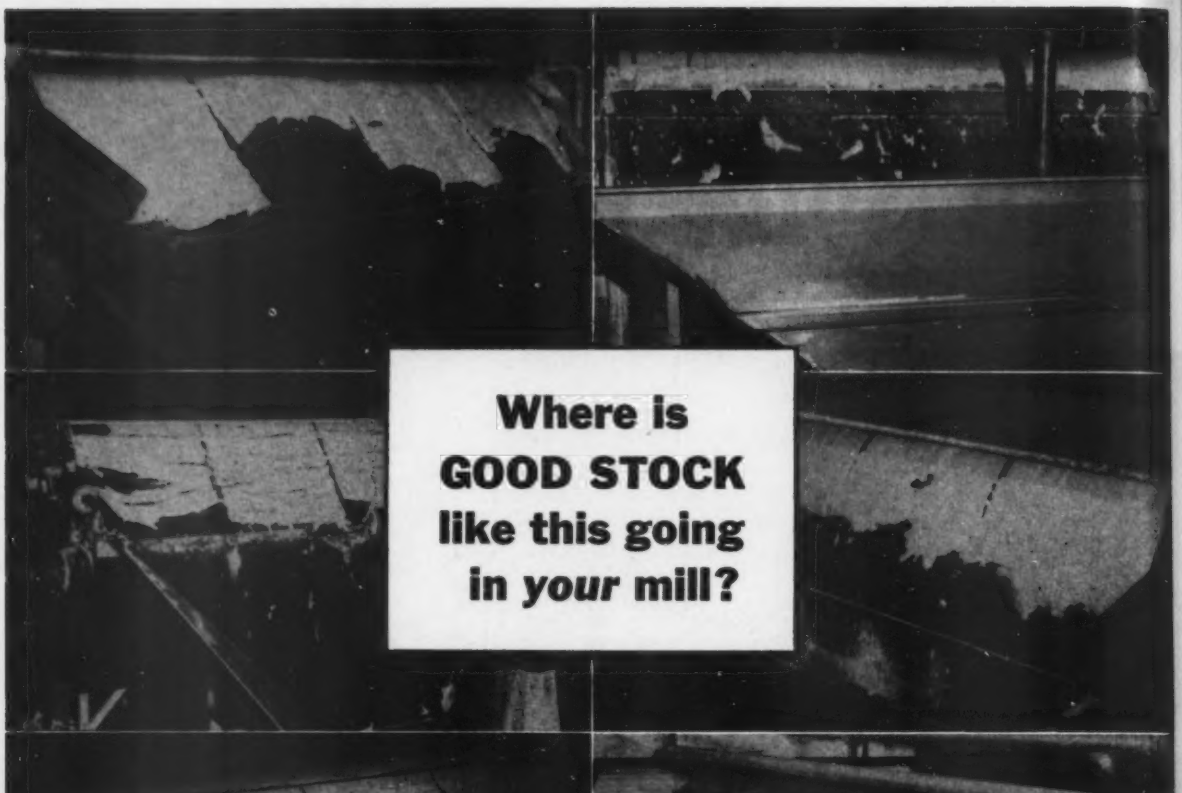

DOWN THE DRAIN ?

— or through a Bird Save-All and back into the machine chest to be turned into a profit?

The whole idea back of the Bird Save-All — and the reason why more than two million pounds of paper are saved by Bird Save-Alls every day — is that it recovers the stock at lowest net cost per ton.

Ask us to work out the figures on net return for you.

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MACHINE COMPANY
SOUTH WALPOLE, MASS.
REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON - ATLANTA 9, GEORGIA
Canadian Manufacturer of Bird Machinery

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CURRENT COMMENTS

Sales above profits — American investments abroad

WARREN B. BULLOCK

Income reports of major paper companies for the first three quarters of 1960 have disclosed the startling effects of the cost-price squeeze. Company after company reports that net income for that period dropped off as compared with a year ago, while sales volume increased. Even those companies which showed an increase in net income experienced a volume of sales in which the percentage of sales was materially above that of the profits.

The companies have not been able to compensate for the increasing costs of production by raising the price of paper. The cost factor has been in generally higher wages and in the costs of materials, which in turn are partially due to wage increases granted by the suppliers. At the same time growth in productive capacity has been greater than the demand, according to the American Paper & Pulp Association's president, capacity having grown four per cent while sales increased only two per cent.

Investments abroad

A feature article in The Paper Industry some months ago reviewed the manner in which United States capital is being invested in paper and pulp mills abroad. At that time no specific figures as to the extent of this migration of capital were available. Now, however, the Department of Commerce "Survey of Current Business" in a report as to direct investment of American capital in manufacturing enterprises abroad discloses the details. In addition to $687,000,000 invested in Canada in 1959, investment in the production of paper and allied products abroad in 1959 totaled $50 million in Latin America, $54 million in Europe, $13 million in Asia, $3 million in Africa and $4 million in Oceania. The total value of all American investments abroad now totals over $30 billion.

Report from Tokyo

Indicative of the future prospective growth of the paper industry of the world as the peoples of the globe become more literate, is a report of a United Nations conference at Tokyo which cites Asia's need for four and a half billion dollars for new paper and pulp mills in Asia in the next 15 years. The report was that of a United Nations conference on pulp and paper development. It was estimated that the present demand for paper in the Far East of 6,000,000 tons a year will increase by 1975 to 18,000,000 tons. Of the funds needed for this added production capacity it was estimated that one billion would have to be provided from outside the region. To guarantee such investments the conference suggested a multi-nation approach, government grants and proper safeguards for private capital from overseas.

The conference expressed a belief that modern processes will make it possible for the Far East to supply its own raw material needs by reason of discoveries which involve the utilization of hard woods for paper pulp instead of the soft woods of the occident.

The exploitation of the paper making resources of the Orient is exemplified by two recent developments. Crown Zellerbach Corp. has joined in a $30 million project for the production of paper from bagasse in India. The plant will be a joint enterprise of the United States company with Sahu Jain Ltd., of Calcutta and the Hawaiian Development Co. The Indian Government has granted a license for a 60,000-ton newsprint mill in Karad, Maharastra State.

In addition to this project the Export Import Bank has authorized a credit of $4,300,000 to help finance the construction of a paper and paperboard mill at Erode, Madras State, India. The borrower is the Seshasayee Paper & Board Co. Ltd. The mill is expected to cost $13,000,000 and nearly $7,000,000 of the cost will be in the purchase of United States equipment and technical services. The mill will use both bagasse and bamboo as its raw material.

Exports of pulp and paper for the January-July period of 1960 showed a large increase as compared with the same months of 1959. Pulp exports rose to 652,149 tons this year as against 346,740 tons in 1959. Paper, paperboard and paper products rose to 558,186 tons from last year's total of 486,106 tons.

Net incomes

Union Bag-Camp Paper Corp. — Nine months ended Sept. 30, $14,540,073; a year ago, $14,696,739. Sales rose to $164,266,917 as against $152,363,063 a year ago.

Rayonier Inc. — First three quarters of 1960, $7,939,893; a year ago, $9,594,606. Sales rose to $100,233,769 as against the previous year's $95,993,040.

St. Regis Paper Co. — Nine months ended Sept. 30, $16,766,139; a year ago, $22,144,275. Sales rose to $386,839,066 from $368,157,834 a year ago.

Mead Corp. — Forty weeks ended Oct. 2, 1960, $10,131,693; a year ago $10,437,251. Sales rose from $245,530,130 to $256,034,522.

Crown Zellerbach Corp. — Nine months ending Sept. 30, $30,608,000; a year ago, $28,966,000. Sales increased 6½ per cent over 1959.

Scott Paper Co. — Nine months ended Sept. 30, $19,833,047; a year ago, $17,708,250. Sales increased from $219,362,856 to $234,472,476.

Keyes Fibre Co. — Nine months earnings were $1,615,609; a year ago, $1,458,956.

MacAndrews & Forbes Co. — First three quarters of 1960, $556,204; a year ago, $563,197.

Great Northern Paper Co. — Earnings for 40 weeks ended Oct. 9, $1,909,236; a year ago, $1,082,985.

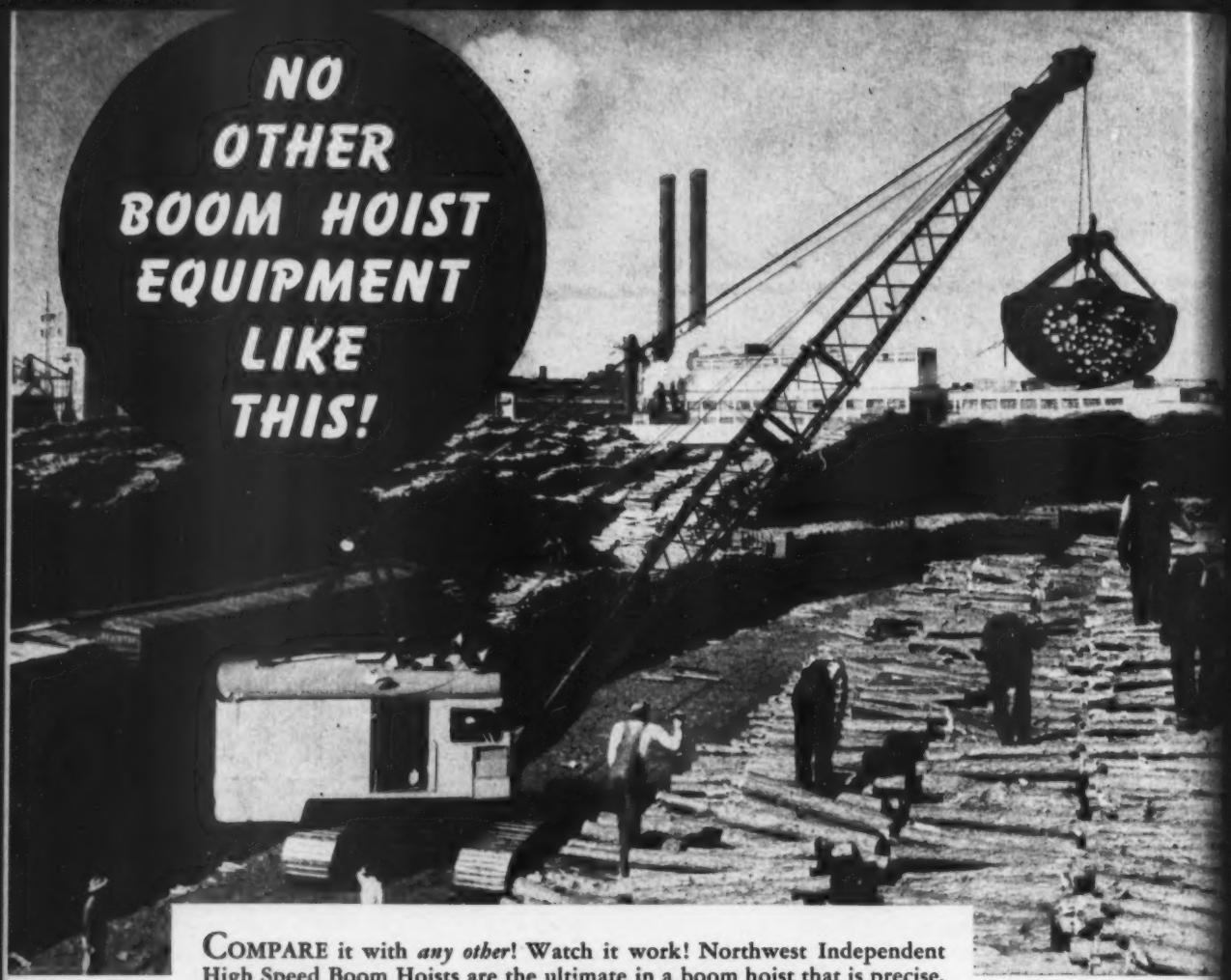
Certain-teed Products Corp. — Nine months income, $1,743,895; a year ago, $2,736,234.

Federal Paper Board Co. Inc. — 36 weeks ended Sept. 10, $2,601,000; a year ago $3,708,000.

Riegel Paper Corp. — Nine months ended Sept. 30, $2,098,926; a year ago, $2,620,355.

(Continued on page 669)

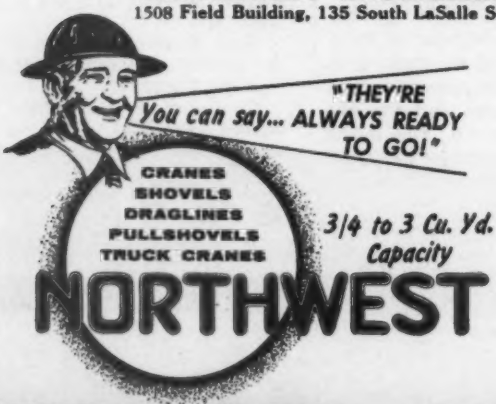
NO OTHER BOOM HOIST EQUIPMENT LIKE THIS!

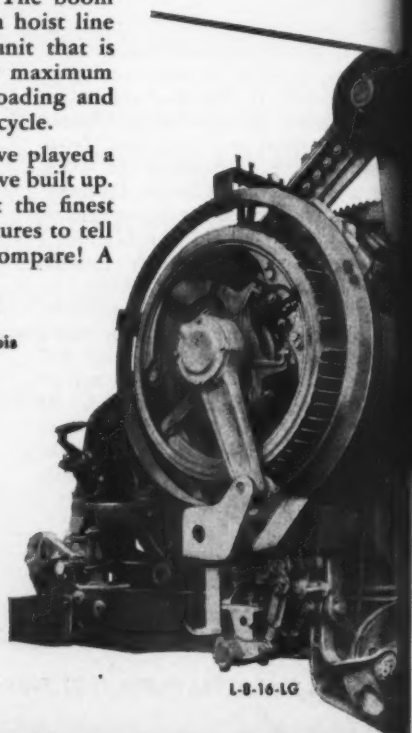


COMPARE it with *any other*! Watch it work! Northwest Independent High Speed Boom Hoists are the ultimate in a boom hoist that is precise, fast and durable. It is a complete unit and is specifically designed for crane work where constant booming is a requirement. It is not an adaptation or modification of the ordinary spur gear type boom hoist. It is independent in operation of all other machine functions. The boom can be raised or lowered with or without a load on the main hoist line and it is power controlled both up and down. Here is a unit that is unique for its high capacity for continuous operation under maximum load without overheating or fading. It is the answer to log loading and decking, where the boom angle must often be changed every cycle.

Here is another of the many Northwest advantages that have played a part in the big output records that Northwest Log Loaders have built up. It is one of the many things that has made the Northwest the finest machine of its kind. Northwest has many new log loader features to tell you about. Get into the details before you buy! Look and compare! A Northwest man will be glad to tell you all about them.

NORTHWEST ENGINEERING COMPANY
1508 Field Building, 135 South LaSalle Street, Chicago 3, Illinois



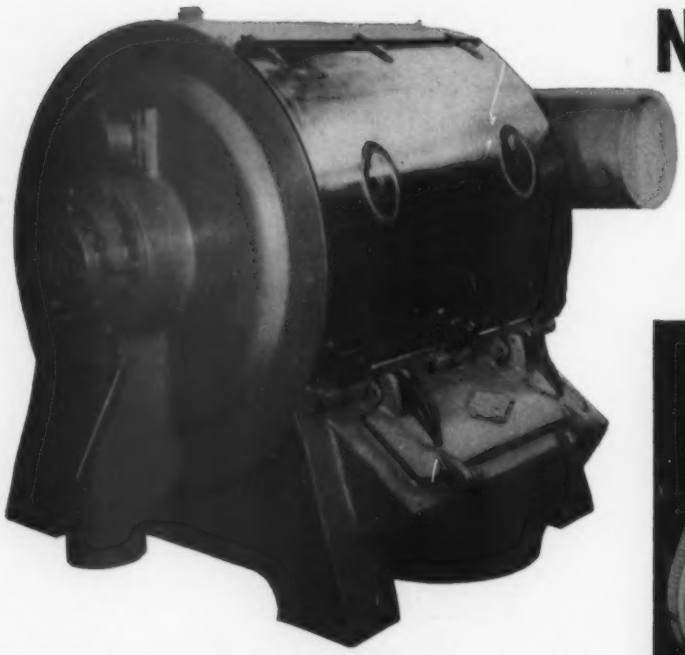


L-8-16-LG

Today, all of Weyerhaeuser's modern mills stand ready to satisfy your needs for bleached sulphite and bleached kraft.

Weyerhaeuser Company

Pulp and Paperboard Division



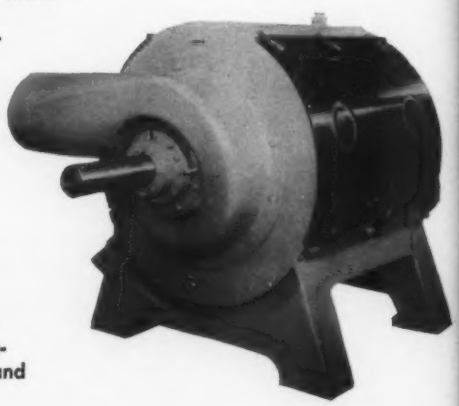
NEW ADVANCES IN LOW COST QUALITY PULP SCREENING

IMPCO CENTRIFUGAL SCREENS FOR:

Washed Stock Screening
Hot Stock Screening
Sealed Black Liquor Knotting
Fibre Length Classification
Paper Stock Cleaning

The new Impco Centrifugal Pulp Screen is the latest example of the progress made toward the ultimate in low cost quality screening. This screen incorporates many improved principles and features such as:

- — a stock inlet allowing direct top, bottom, front or rear infeeding which simplifies installation piping;
- — a tangential inlet which changes flow direction from linear to rotating, yet retains velocity head;
- — a special stator which provides uniform internal distribution of pulp;
- — a patented high-efficiency rotor which increases capacity without additional horsepower;*
- — a bottom accepted stock outlet permitting all sub-floor piping;
- — a full length quick-opening door for routine accepted stock sampling;
- — an accessible rejects outlet for tailings inspection or sampling.



These features are resulting in peak capacities and high discharge consistencies at lowest horsepowers. Reject richness is readily controlled. Engineered simplicity is characteristic of the entire line of Impco Centrifugal Screens which require very little operating attention and mechanical maintenance.

* U. S. Patent No. 2,845,848.

IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE

IMPCO®

In Canada, Sherbrooke Machineries Ltd., Sherbrooke, Quebec

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Current Comments . . .

(Continued from page 665)

St. Croix Paper Co. — Thirty-nine weeks ended Oct. 2, $1,129,568; a year ago, $821,050.

Nekoosa Edwards Paper Co. Inc. — Nine months, $1,965,838; a year ago, $2,376,911.

Paterson Parchment Paper Co. — Nine month of 1960, $278,582; a year ago, $418,935.

United Board & Carton Corp. — Twelve weeks ended Aug. 21, $29,913; a year ago, $84,206.

P. H. Glatfelter Co. — Nine months income, $408,225; a year ago, $345,493.

Container Corp. of America — First three months of 1960, $14,076,000; a year ago, $14,609,000. Sales rose to $245,544,000 from $240,896,000.

Champion Paper & Fibre Co. — First nine months of 1960, $4,137,000; a year ago, $4,292,000.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	November 10, 1960	October 10, 1960
American Can	33	34
Same Pref	36	36⅛
Celotex	22⅞	21⅛
Same Pref	*17⅛-17⅜	*17½-18
Certain-Teed	12⅜	11⅛
Champion P & F	28⅛	27⅜
Same Pref	30½	——
Chesapeake of Va	33	34
Container	23	21⅝
Same Pref	*91½-94	*93-95
Continental Can	33⅞	35½
Same Pref	*78½-79½	79
Crown Zellerbach	47⅝	43
Same Pref	90½	*92¼-94
Diamond National	32⅜	34½
Same Pref	*30-30⅜	30¼-30½
Federal Paperboard	33	34
Same Pref	*21⅜-22⅜	*22¾-23
Fibre Paper Board	28⅞	27¾
Great Northern	40¼	39
Hammermill	28	*29-29½
International	100⅜	88⅞
Same Pref	*92¾-93¾	*92¼-94
Kimberly-Clark	80¾	80¾
KVP Sutherland	28⅜	26⅜
MacAndrews & Forbes	*26½-26⅜	28
Masonite	30¼	27⅜
Mead Corp.	36¼	34⅜
Same Pref	*86-87½	86-87⅜
Minn. & Ont.	30½	29½
Nat. Vulc. Fib.	20½	21
Oxford Paper	26⅛	24
Same Pref	88½	*89¼-91
Rayonier	16¾	16⅛
Riegel Paper	27¾	*27-27½
St. Regis	35½	31¾
Same Pref	*91-94	*92-95
Scott Paper	87⅛	87¾
Same $4 Pref	87	*95-87
Same $3.40 Pref	*74-75	*77¼-78
Sealright	23½	23⅞
Standard Packaging	23½	23⅞
Same $1.60 Pref	*63-75	70
Same $1.20 Pref	29⅛	*30-30¼
Same 6% Pref	29⅛	29¾
Union Bag-Camp	31¾	30
United Bd. & Carton	*17⅛-18	20⅛
West Va. P & P	36	35¾
Same Pref	93½-97½	*94-97½

New York Stock Exchange — Bonds

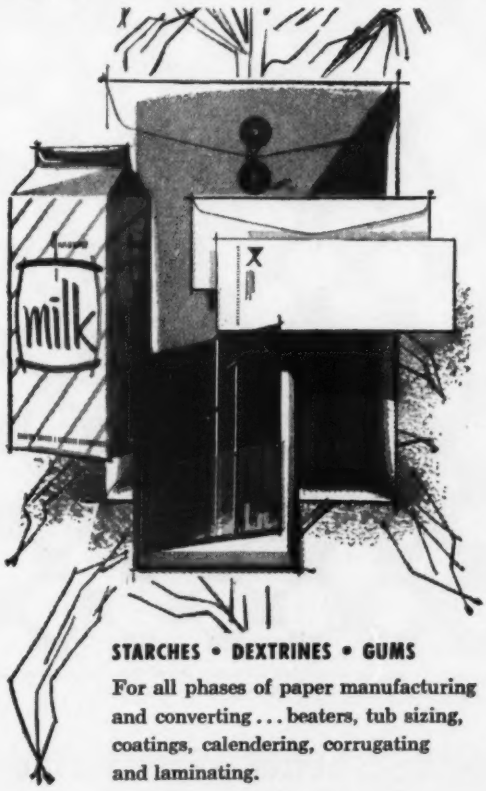
Champion P&F Co 4½%	104	104½
Champion P&F Co 3¾%	92⅛	91¼
Diamond Gardner 4%	——	——
Kimberly-Clark 3%	——	92⅝
Oxford 4¾%	104⅛	104
Scott Paper 3%	111¾	113¾

American Stock Exchange

Allied Paper	11⅛	11⅜
American Writing	30	31
Brown Co.	14⅛	13¾
Puget Sound	21½	20¼

*Closing Bid and Asked Prices.

Look what happened to the corn we took off the cob



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For all phases of paper manufacturing and converting . . . beaters, tub sizing, coatings, calendering, corrugating and laminating.

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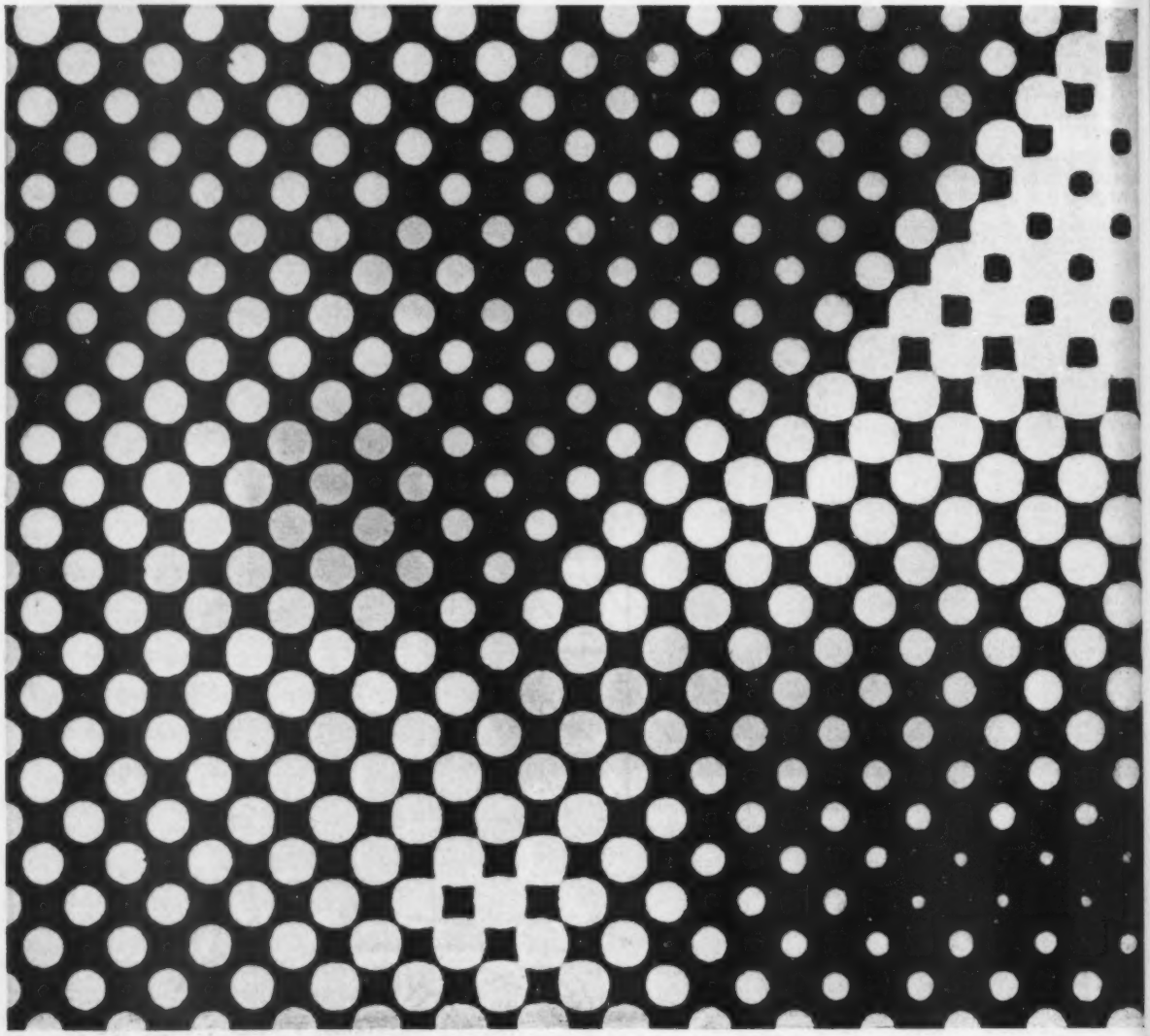
DOW | LATEX



120-line screen letterpress impression magnified 23 times shows the sharp, clean printing that results from the smooth surface achieved with new Dow Latex 630.

Now... better paper surface... better printing... with **NEW DOW LATEX 630**

- **Superior Pick Resistance!**
- **Excellent Mechanical Stability!**
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With NEW DOW LATEX 630 in your coatings, your paper can set a new high standard for printability. Clear, sharp, true-to-life reproductions . . . because the paper surface is smoother, more uniform and more resistant to picking. Dow Latex 630 was developed to give you every manufacturing and sales advantage.

Dow is ready to help put Dow Latex 630 to work for you on better paper . . . for better profits. Write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 1935DN12.

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NEWS of the INDUSTRY

Paper From 100% Man-Made Fibers

Manufacturing of paper from 100 per cent man-made fibers will now be possible with a new rayon fiber developed by American Viscose Corp. of New York.

This new fiber is known as RD-101. It is a short, multi-cell rayon fiber with unique properties said to be in no other fiber, either natural or man-made. When formed into a wet-laid web and dried, these nonthermoplastic, multicellular, cellulosic fibers firmly bond themselves and lock into place other fibers with which they are intermixed. This characteristic means they can be used to produce wet-formed, nonwoven fabrics and papers of 100 per cent RD-101 fibers or in a blend with other fibers or pulp. It makes possible a wide range of textures and physical properties, either with or without the addition of other bonding agents.

Complete information, as well as experienced technical assistance in the use of RD-101 rayon fiber, can be had by contacting American Viscose Corp., Industrial Merchandising & Product Development Department, 350 Fifth Ave., New York 1, N.Y.

Institute For Better Packaging Reorganized

The Institute for Better Packaging has been reorganized to serve as the trade association of paperboard packaging manufacturers and will devote its efforts to research and promotion of packaging techniques for dairy, frozen food and meat products.

Major emphasis will be placed on studies and activities of: technological improvements, marketing analyses; package machine development; coatings and quality control for frozen foods, meats, edible fats and dairy products.

Current studies are now underway in the following areas: graphic arts; warehousing; packaging and handling operations.

The ultimate aims of the Association to the member manufacturers are: (1) well-planned research programs not generally undertaken by the individual companies; (2) the development of standardized procedures and technical developments for better cartons and customer satisfaction; and (3) development of information in relation to the production, warehousing, and inventory problems affecting the industry and its customers.

Buckeye Uncovers Historic Tree Markings

A surveying crew from Buckeye Cellulose Corp., Memphis, Tenn., discovered boundary marks which had been preserved inside of cypress trees for 131 years.

These markings were carved on the trees in 1829 by R. C. Allen, a government surveyor — just ten years after the United States bought Florida from Spain. They are part of the original government survey which divided Florida into the system of townships, ranges and sections still used as the basis for most of the land-marking done in the state today.

The crew, engaged in checking boundaries in a section of the company's 800,000 acres of woodlands in northern Florida, were guided by photostatic copies of Allen's report. They waded into a swamp to locate one of his "survey corners" and then found three of the four original "witness trees" still standing. The bark of the cypresses, continuing to grow through the decades, had hidden Allen's marks completely. The crew had cut into the trees to uncover them.

"It was a big thrill to realize we were chopping down into 131 years of history", the crew leader remarked. "It also proved to us that our boundary marking methods are good and that we can depend on them".

Recent Expansions in the Industry

H. George and D. Harbron work on refined stock samples in the fully equipped testing laboratory of the Research Center.

C. H. Eisenmenger, vice-president and D. G. Driscoll of Sorg Paper Co. study a hand sheet held by Black-Clawson Vice-President D. H. Montville. Laboratory Director H. P. Espenmiller supervised the test run.

J. Litwak and T. Litsch prepare for pilot run of Hydrapulper with new Vokes rotor. Extensive electrical controls and automatic recording meters speed up test runs and tabulation of results.

Black-Clawson's New Research Center

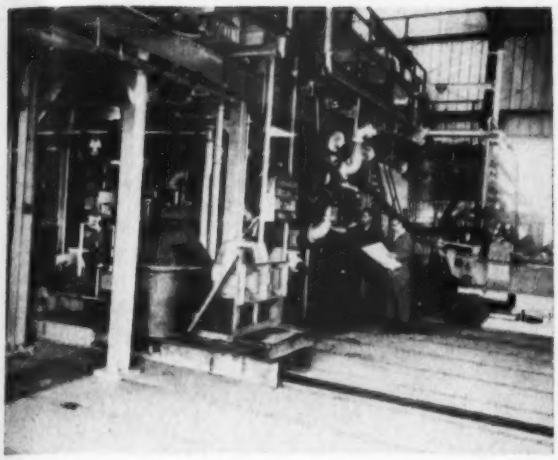
The Black-Clawson Co. of Middletown, Ohio, has completed the construction of the company's new pulping and papermaking research and development laboratory. This Research Center is housed in a specially designed building on the site of B-C's Shartle Division.

At the recently held "start-up" ceremonies, Frank T. Peterson (president of the Black-Clawson Co.) described the objective of the new Research Center by saying: "The work we do here in improving the various machines of our integrated equipment line is our best guide to greater service to the pulp and paper industry and to the expansion of our company. Technological advancements — so important to us and to the industry we serve — do not materialize out of thin air. They must be won by the sustained effort of skilled researchers who have tools and budgets suitable to the task. This building and equipment give our experienced and dedicated development engineers an increased opportunity of advancing Black-Clawson technology in step with the growing needs of the pulp and paper industry".

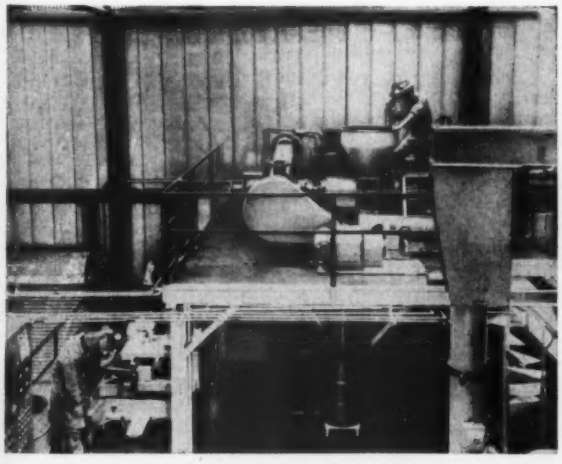
The Research Center is operated by the research and development department of B-C under Joe Baxter Jr., research director and H. P. Espenmiller as director of the Research Center. In addition to development work in pulping and stock preparation for the benefit of the Pandia and Shartle Divisions, the Center also carries out certain research projects for the Paper Machine Division which is located in Watertown, N.Y.

Major equipment installed at the Center includes: (1) Complete wet and dry testing stock preparation laboratories and pilot plant, expanded and moved from its original location in Fulton, N.Y.; (2) A new Pandia ChemPreg Cold Soda Pulping System pilot plant; and (3) Special equipment for testing new papermaking techniques.

The layout of the pilot equipment for pulping, cleaning,



Pictured above is J. Litwak and Laboratory Director H. P. Espenmiller checking the results of a pressure refining test run.
A variety of pilot stock preparation equipment permits simultaneous scheduling of several test programs.
Photo below shows demonstration pulping of various hardwoods underway in the new ChemPreg Cold Soda pulping plant in one section of the Research Center. P. Marsh is checking out the wood chip impregnation equipment and Pandia reactor tube on the upper mezzanine. A. Johnson inspects the Chemifiner fiberizing unit of the system on the lower level.



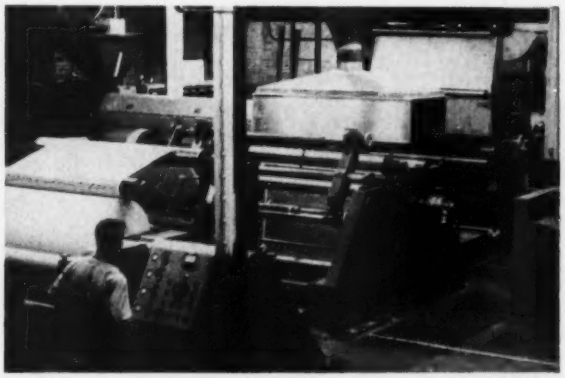
screening and refining paper stock is designed to permit duplication of a variety of stock preparation procedures. Pilot scale units of such standard B-C equipment as the Hydrapulper, Selectifier screen, Liquid Cyclone, Sutherland refiner, jordans, Breaker trap and pumps, form the basis of the stock preparation system.

The new Pandia ChemPreg System installed in the pilot plant is a continuous system consisting basically of two presses with a reactor tube in between. These are followed by a mechanical defibering stage utilizing the B-C Chemifiner. This system is said to offer opportunities to pulp and paper producers in nearly every area to obtain economical pulp from relatively cheap hardboards, lumber mill wood waste, agricultural fibers, and in some cases, softwoods.

Thilmany Starts-up Third Polyethylene Extruder

Thilmany Pulp & Paper Co. of Kaukauna, Wis., recently started production on the company's third polyethylene extruder. This new Egan unit trims 60 in. and operates at speeds up to 1,000 fpm. The highly flexible unit also incorporates many innovations in design which permit supplementary operations not previously possible. An improved unwind stand allows flying splices to be made at high speeds in either unwind direction.

With this third unit in operation, the company now produces a full range of poly-coated and laminated papers and paper-foil combinations. Thilco surface-treated poly coatings — a recent development which permits the use of conventional pasting, gluing and printing methods on the poly — is also included in the line.



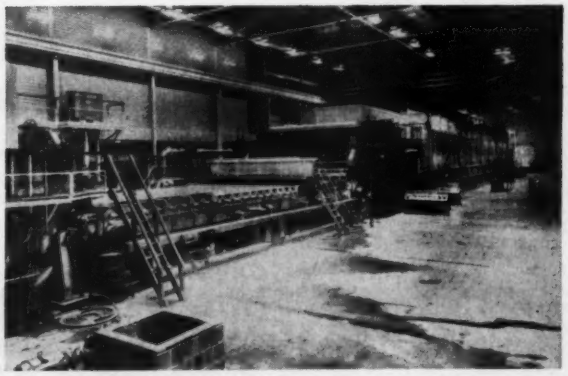
Fraser's No. 7

Fraser Paper Ltd. is now operating its new 234-in., No. 7 paper machine at the company's bond paper mill located in Madawaska, Me.

The new unit is 300 ft. in overall length (including the headbox and winder) and the width (with drive units and hood) is about 60 ft. Designed for a maximum speed of 2000 fpm., the unit is currently producing at a rate exceeding 100 tons per 24 hr.

Construction of a new building adjacent to the bond paper mill was necessary to house the No. 7. It was made large enough to house two machines — the second machine to be installed when conditions warrant. To service the larger rolls of the machine, a Farrell-Birmingham roll grinder was installed in a separate addition which also has facilities for spare roll storage for the bond mill.

The photo shown here was taken from the wet end of the new No. 7.



Keyes Fibre Plans California Plant

Keyes Fibre Co. of Waterville, Me., has announced plans for a new manufacturing plant to be built in Sacramento, Calif. These plans are now subject to stockholder approval.

The expansion would provide better service to present customers in the west coast area and afford Keyes a greater opportunity to take part in the rapidly growing economy of this section of the country. It was revealed that the feasibility of such an undertaking has been the subject of study by Keyes over a number of years.

This new plant is not expected to have any extended effect on the volume of products made in the company's Waterville, Me., and Hammond, Ind., plants.

Keyes has taken an option on a manufacturing site of approximately 30 acres in Sacramento. Anticipated cost of this project was not announced.

Dennison Breaks Ground at Framingham

Dennison Mfg. Co. has broken ground for the construction of a new, two-story building at Framingham, Mass. This new building will add 62,000 sq. ft. to the present plant in Framingham. It will provide more space for the experimentation on and development of new products.

Completion of this new structure is scheduled for the spring of 1961.

American Cyanamid Co. Plans New Plant

American Cyanamid Co. of New York will build a new plant in Vancouver, Wash., to produce chemicals for the paper industry of the area. The plant will include a structure for housing production and processing equipment, as well as warehouse facilities and will provide for later expansion. It is expected to be in operation in 1961.

Rayonier to Erect Recovery System

The Chicago Bridge & Iron Co. is now in the process of erecting the evaporator section for the recovery system being built at Rayonier Inc.'s Hoquiam, Wash., mill.

This new system is said to be the world's largest single sulfite recovery system designed for chemical recovery and pollution abatement. The Rayonier-developed process will permit recovery and re-use of at least 85 per cent of pulping chemicals and provide an especially pure effluent.

Combining both forced and natural circulation designs, the million-dollar, sextuple-effect evaporator is designed to remove 200 tons of water from spent red liquor per hour. The vapors and resulting condensate will be further processed to purify it even beyond usual practice.

N.Z.F.P. To Construct Second Wallboard Mill

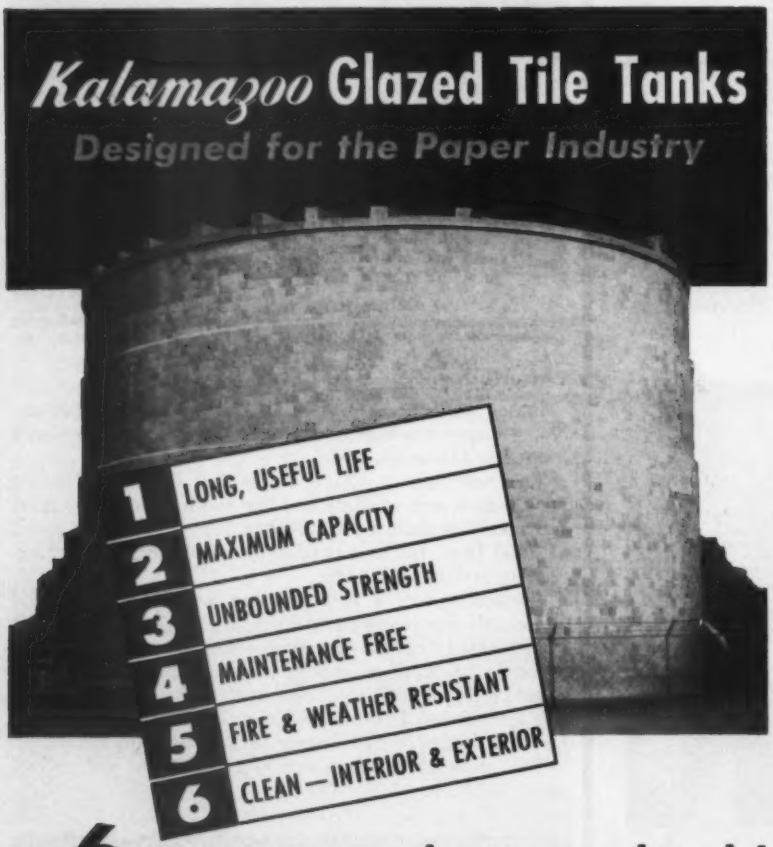
The New Zealand Forest Products Ltd. of Penrose, Auckland, New Zealand, expects to have a second wallboard mill in production within a year. Construction began recently at its Penrose plant. It involved the demolition of the old casemill and sawmill buildings.

Production of both insulating board and 8- by 4-ft. smooth-two-sides hardboard, has been running at the present "Pinex" mill for 19 years. Present capacity has reached 80 tons per day. The new mill will start up with an output of an additional 40 tons expandable to 80 tons per day.

Tayler Corp. of Elizabeth, New Jersey will supply most of the machinery, although much of the design and engineering rests with New Zealand Forest Products.

An innovation in the industry will be the double drum board forming unit made by Ahlstrom of

(Continued on page 676)



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TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

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"Reminds me of HAMILTON Felts' technical advances!"

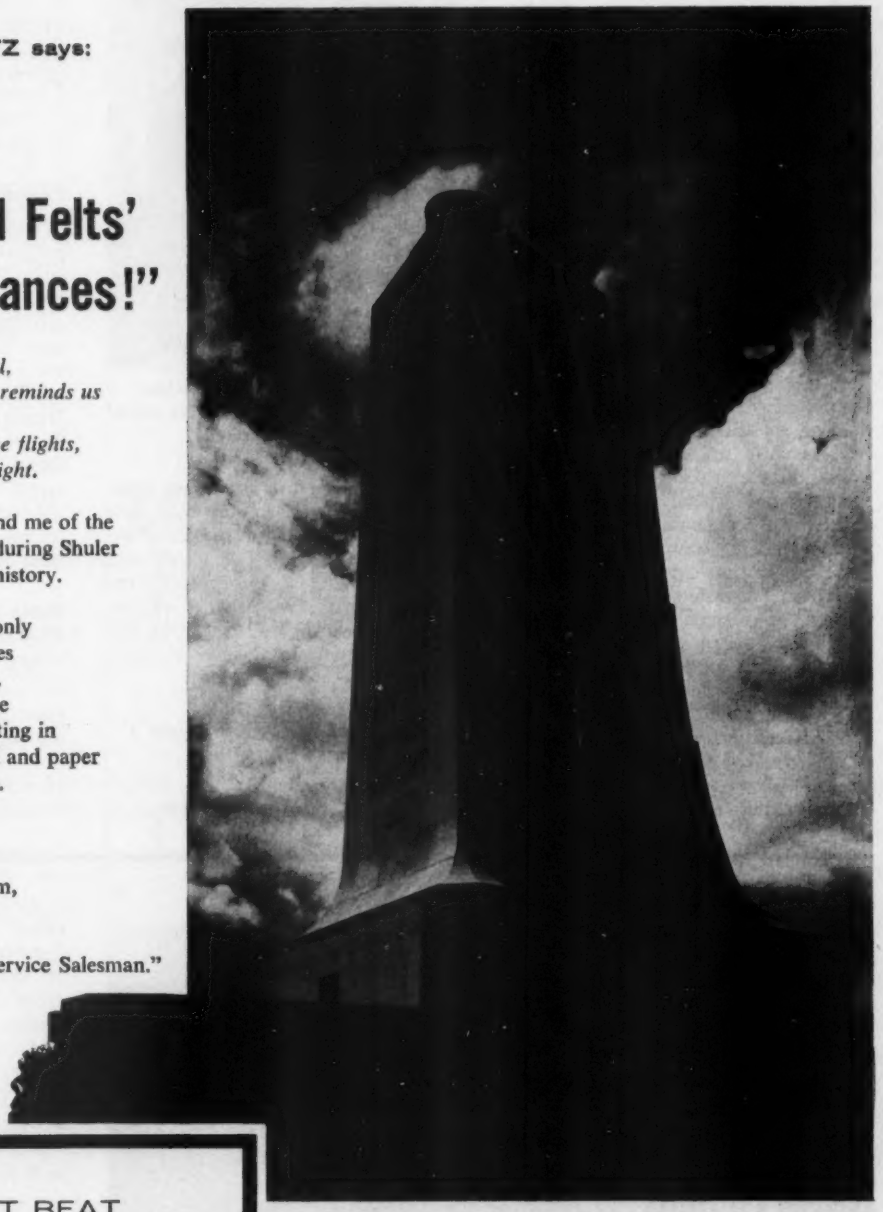
"The Wright Brothers' Memorial, at Kitty Hawk, North Carolina, reminds us of a great technical advance — the first engine-propelled airplane flights, made by Orville and Wilbur Wright.

"Similarly, Hamilton Felts remind me of the many technical advances made during Shuler & Benninghofen's 102-year old history.

"For, Hamilton Felts have not only kept pace with the great advances in papermaking technology, but, in many cases, have helped make these advances possible — resulting in the manufacture of better board and paper at higher speeds and *lower costs.*

"If one of our 300 modern, technically proved patterns won't solve *your* specific problem, we'll be happy to design a Hamilton Felt that will. Just ask your Hamilton Felts Service Salesman."

*Idea submitted by Harold E. Rowland, Continental Can Co. Inc., Hopewell, Va.
Photo by: Ewing Galloway, New York



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Finland, as opposed to the existing one-drum unit now in operation at Penrose. The two drums will rotate in opposite directions, the pulp will be picked up on the surface of both, then pressed together and led over one of the drums.

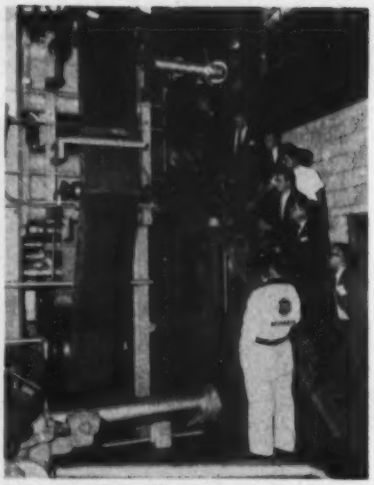
Bauer pulpers for the new plant have also been ordered from the U.S. Wallboard Machinery Co.

Black-Clawson Hosts Ohio TAPPI Group

A meeting, organized by the Ohio Section of TAPPI with the cooperation of the Black-Clawson Co., was held recently in Middletown, Ohio.

Black-Clawson Co. was host to a group at a luncheon which was followed by three seminars on new developments in continuous pulping, stock preparation equipment, and the utilization of waste paper in the production of various types of paperboard. The group visited the Shartle Division plant of B-C and toured the machine shops and the new B-C Research Center which was recently constructed on the plant site.

This research Center houses a variety of pilot model equipment for improved pulping and papermaking.



Experimental vertical paper machine at Black-Clawson's Research Center is viewed by visiting Ohio Tappi members.

The pilot system for producing wood pulp by the new ChemPreg cold soda pulping process was of particular interest to the group. The group was also shown the laboratory scale, experimental paper machine of radical design, on which B-C is testing the feasibility of forming a sheet of paper vertically.

Expansion of Allied Chemical's Solvay Process Division

A major expansion of Allied Chemical's Solvay Process Division will approximately double facilities at the Syracuse, N. Y., research-technical service laboratory. Among the special laboratories being enlarged to meet research and customer requirements are those for studies in corrosion, pulp and paper, and plastics. The laboratory expansion will also provide enlarged facilities for Solvay's technical service and market research divisions.

Fuller Moves to Compton

Fuller Co.'s Los Angeles sales office has been moved to its modern plant in Compton, Calif. The move was made to centralize Fuller's activities in the greater Los Angeles area and provide customers with more efficient sales and service.

The new offices are at 2966 E. Victoria St. in Compton, where Fuller, a subsidiary of General American Transportation Corp., maintains light metal fabrication facilities and a stock of repair parts for its pneumatic handling and component equipment.

India Plans Newsprint Mill — Will Use New Patented Process

Newsprint made from bagasse will be produced in a new $20-million plant at Karad in Maharashtra State, 220 miles from Bombay, India.

Crown Zellerbach Corp. and the Hawaiian sugar industry, acting through the Hawaiian Development

Educational Foundation Established

Foundation founders talk plans with Dean Hardy Shirley of the N. Y. State College of Forestry, middle; H. M. Gray, vice president of Sealright-Oswego Falls Corp.; M. D. Conklin, treasurer of Champion Paper & Fibre Co.; Dean Shirley; W. B. Morehouse, vice president of Nopco Chemical Co.; and R. F. Vokes, vice president of Black-Clawson Co., first president of Syracuse Pulp & Paper Foundation Inc.

A newly organized foundation called the Syracuse Pulp & Paper Foundation Inc. has been established by leading paper companies to help gifted science students (who have chosen the paper industry for a career) to obtain their pulp and paper making education at the New York State College of forestry at Syracuse University.

Aid given to these students will be in the form of scholarships, grants or non-interest bearing loans according to the student's circumstances.

At the organizing meetings of the Foundation, the following officers were elected: President — Robert F. Vokes, vice president of Black-Clawson Co., Middletown, Ohio; Vice President — W. B. Morehouse of Nopo Chemical Co., Newark, N.J.; Secretary — Dr. Frederic W. O'Neil, head of the pulp and paper technology department of the Forestry College; and treasurer — G. H. Haines, business officer of the Forestry College.

Co. have announced a joint agreement with Sahu Jain Ltd. of Calcutta, India, to provide technical assistance and patent rights for the production of newsprint from bagasse.

Sahu Jain Ltd. is the managing agency for one of India's largest industrial complexes, comprising companies engaged in the manufacture of paper, sugar, cement, heavy chemicals and nitrogenous fertilizers. As a result of the agreement, a member of the Sahu Jain complex, Rohtas Industries Ltd. is planning to build the newsprint mill. The proposed plant will have an annual capacity of 60,000 tons of newsprint, with bagasse as the main source of pulp.

In 1952, C-Z and the Hawaiian Sugar Planters' Association began conducting joint laboratory research on bagasse. The research project involved both extensive pilot plant experimentation and successful commercial size test runs of bagasse newsprint in C-Z's Northwest facilities. This experience led to the patented processes to be utilized in the proposed new Indian newsprint mill. The new process is said to represent a technological advance over existing methods for refining and pulping bagasse.

Polymer Industries Opens Plant Expansion

Polymer Industries Inc. of Springdale, Conn., has recently dedicated a plant expansion necessitated by accelerated demand for high-performance industrial adhesives and textile specialty polymers.

The new plant expansion doubles the previous laboratory, production office and warehousing space, and includes an all-new office area, a tank farm, a solvent-mixing plant, a polymerization plant, and a 100 per cent increase over former production and laboratory areas.

Coming Events

TAPPI

January 19 — Annual Papermakers Get-Together, Hotel Harris, Kalamazoo, Mich.
February 19-23 — 46th Annual Meeting, Commodore Hotel, New York, N.Y.
March 16 — Graphics Arts, Inmans, Galesburg, Mich.
April 6 — Visit Michigan Carton, Inmans, Galesburg, Mich.

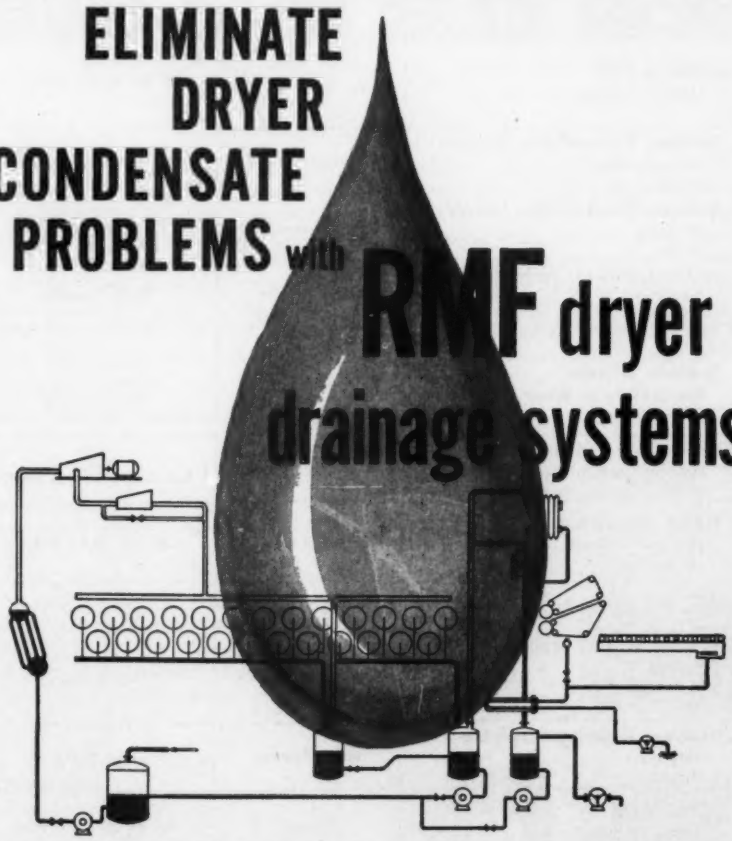
PIMA

January 12 — Connecticut Valley Division (Winter Meeting), Publick House, Sturbridge, Mass.
January 19 — Annual Papermakers Get-Together, Hotel Harris, Kalamazoo, Mich.
February 9 — Training Machine Room & Stock Preparation Personnel, Hotel Harris, Kalamazoo, Mich.
March 16 — Joint Meeting with Craftsmen, Inman's Restaurant, Galesburg, Mich.
April 22 — Ladies' night, Hotel Harris, Kalamazoo, Mich.
May 4 — Tri-Way Meeting (PIMA, CPPA, TAPPI), Hotel Harrison, Hot Springs, B.C., Canada.

OTHER MEETINGS

January 23-26 — 12th Annual Plant Maintenance & Engineering Show, International Amphitheatre, Chicago, Ill.
January 24-27 — CPPA (Technical Association), Queen Elizabeth Hotel, Montreal.
January 26 — National Association of Secondary Materials Industries (Midwestern Division), Statler-Hilton Hotel, Detroit, Mich.
January 30-February 9 — Quality Control Short Course, University of Illinois, Urbana, Ill.
February 6-10 — Norelco X-Ray School, Henry Hudson Hotel, New York, N.Y.
February 13-16 — 15th International Heating & Air-Conditioning Exposition, International Amphitheatre, Chicago, Ill.
February 20-24 — APA 1961 Annual Meeting, Waldorf Astoria, New York, N.Y.
February 20-24 — APPA 1961 Annual Meeting, Waldorf Astoria, New York.

ELIMINATE DRYER CONDENSATE PROBLEMS with RMF dryer drainage systems



• *Increase Dryer Capacity* • *More Uniform Drying*
• *Higher Production* • *Prevent Reject Sheet*

Our Dryer Drainage Systems will effectively eliminate your water condensate problems. Drying capacity is substantially increased and you get more effective drying at lower temperatures. In addition, RMF Systems result in more uniform drying across the sheet, assuring automatically graduated dryer temperatures. This lessens shrinkage, cracking, curling, wet streaks and hardening.

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CHEMICAL USERS' GUIDE

To General Chemical Products for the Paper Industry

Product	Available Forms	Commercial Strengths	Shipping Containers	Applications
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + Water *(Liquid Alum)*	Commercial & Iron Free: Liquid	36.5° Be (8.3% Al_2O_3)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	99.5% Na_2SO_4 95% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Sulfuric Acid H_2SO_4 + Water	Liquid	66° Be (93.2% H_2SO_4)	Carboys Drums Tank Trucks Tank Cars	Wire souring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate, Crystal $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Thiosulfate, Anhyd. $Na_2S_2O_3$ *(Hypo)*	White Granules	98% $Na_2S_2O_3$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhyd. Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + Water	Liquid	38° to 60° Be Various ratios of Na_2O to SiO_2	Drums Tank Trucks Tank Cars	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper. Aid in bleaching & flocculation.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + Water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Drums Tank Trucks	Used with chlorine to form chloramines for slime control. Biological sludge systems nutrient.
Sodium Fluoride	White Powder	98% NaF	Bags Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhyd. $Na_4P_2O_7$ *(Pyro)*	White Powder	52.1% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Sodium Tripolyphosphate $Na_5P_3O_{10}$ *(Tripoly)*	White Powder	56% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + Water	Liquid	42° Be (67.2% HNO_3)	Carboys Drums Tank Trucks Tank Cars	Nitrating pulp; cleaning monel metal.
Phosphoric Acid, Com'l. H_3PO_4	Liquid	75% H_3PO_4 (54% P_2O_5)	Tank Cars	Nutrient in biological sludge systems.
Hydrochloric Acid *(Muriatic Acid)*	Liquid	18°, 20°, 22° Be (27.4% to 34.1% HCl)	Carboys Drums Tank Trucks Tank Cars	Cleaning machinery.

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

OTHER PRODUCTS: Sodium Metasilicate; Trisodium Phosphate; Copper Sulphate; Disodium Phosphate; Sodium Bisulfite.

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NAMES in the NEWS

Nicolet Paper Corp.

Arthur Snapper, former president of Nicolet Paper Corp., De Pere, Wis., was advanced to chairman of the board. Snapper is also chairman and chief executive officer of Milprint Inc., Milwaukee, Wis., which owns Nicolet Paper.

Henry Fowler, has replaced Snapper as president of the company. He previously was general manager and vice president.

Fred M. Stefan was elected a director of Nicolet and Herbert Wenberg was elected vice-president in charge of technical services.

John W. Bolton & Sons Inc.

Robert Calvert has been promoted to senior sales engineer for John W. Bolton & Sons Inc. and Emerson Mfg. Co., Division, Lawrence, Mass. Calvert assumes responsibility for sales in the southern and southeastern territories.

John Benedict has also been promoted to senior sales engineer and will be responsible for sales in New England and New York State.

Lawrence R. Mitchell was promoted to manager of executive sales. Mitchell assumes responsibility for sales engineering with all OEM accounts and certain paper mill accounts.

Henry H. Gilbert has been appointed manager of application engineering. Gilbert has charge of product and systems applications, field engineering and exploration involving the company's line of stock preparation equipment.

Frank W. Egan & Co.

Francis X. Lee Jr., controls engineer for the company in Somerville, N. J., has been promoted to sales engineer. Lee was formerly employed by Curtiss Wright Corp. and Kearfott Co. Inc.

Abitibi Power & Paper Co.

G. J. Morrisette, mill manager of the Iroquois Falls Newsprint Div. of the company, has retired. Morrisette has been a prominent paper mill executive for many years and is equally well-known among newspaper publishers.

R. L. Fraser has been appointed mill manager to replace Morrisette. Fraser has been associated with the company at the Ste. Anne Paper Co. Ltd., Beaupre, Quebec; and Manitoba Paper Co. Ltd., Pine Falls, Manitoba.

T. C. Garren

G. R. Virgil

H. L. Roszell

R. F. Daily

A. E. Staley Mfg. Co.

Robert F. Daily, legal counsel of the company, was elected secretary. Daily continues as legal counsel and head of the company's law division.

Herbert L. Roszell Jr. was promoted to manager of dextrin and adhesive products. Roszell has been with the company since 1949 as a technical representative in industrial sales and a technical assistant.

Thomas C. Garren was promoted to sales service supervisor. He has been a technical assistant in the industrial sales department.

George R. Virgil has been named a paper technical sales representative. Virgil has been with the company as an industrial sales trainee since 1959.

J. H. Torras

J. E. Fitzgearld

Brown Co.

Joseph H. Torras has been named executive vice president of the Brown Co., Berlin, N.H. Torras previously was sales manager of the Printing Papers Division of St. Regis Paper Co. Torras will make his headquarters in Boston.

Reginald O. Murray has been appointed production superintendent at the company's Cascade Paper Mill, Berlin, N.H. Murray has been assistant production superintendent since 1954.

J. Edward Fitzgearld has been appointed assistant production superintendent at the Cascade Mill. He has spent his entire working career at the Cascade Mill as a paper maker.

A. Howland

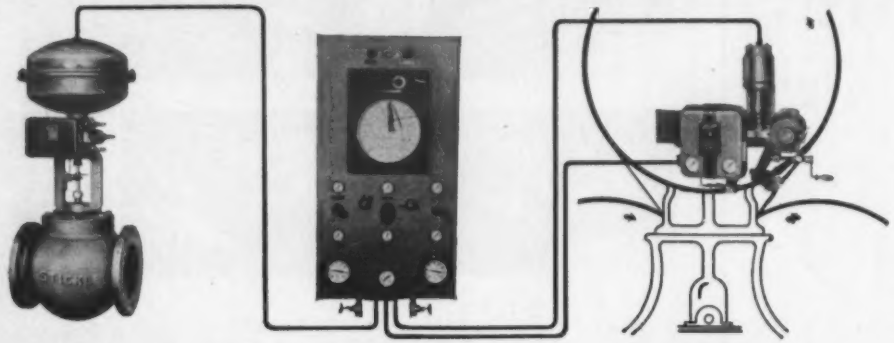
R. O. Murray

Sandy Hill Iron & Brass Works

Amasa Howland has recently joined the sales engineering staff as sales representative in Michigan, Wiscon-

(Continued on page 696)

You Don't Need an Electronic Technician to Run This Moisture Control System . . .



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Engineered to fit individual steam requirements. Responds to the slightest change in moisture content of the sheet. No surging or cycling. Large diaphragm areas assure positive operation.

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Houses all controls and two-pen recorder. Shows steam pressure in dryers and moisture variation in sheet as it passes over dryers. Tells the complete story of dryer operation at a glance.

MOISTURE DETECTOR

The new super-sensitive Stickle detector. Adjustable for any weight of paper—from .0003 to the heaviest board. Numbered dial permits quick setting of desired sensitivity.

It's the Most Simple, Trouble-Free System Ever Built . . . yet Maintains Any Moisture Content Desired within ½ of 1% in Any Weight of Paper from .0003 to the Heaviest Board

The new Stickle Pres-ten-trol uses the time-tested, mill-proven principle of sheet expansion and contraction to regulate steam flow to the dryers . . . provides instant regulation within present limits—with minimum fluctuation . . . records moisture variation of the sheet, steam pressure in dryers, time and duration of wet end breaks . . . maintains steam pressure desired when paper is off the machine. No other system costs so little to buy, install, operate and maintain because no other is so simple, so trouble-free. Write for Bulletin 460-C.

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FOREIGN ABSTRACTS

Biological deterioration of paper

This article presents a comprehensive illustrated report by the Technical Officer of the National Archives of India in New Delhi. It discusses the various organisms that attack paper and suggests their control. The areas covered include: degradations due to microorganisms with special reference to fungi and slime-forming bacteria; the attack of silverfish, cockroaches, termites, cadelle larvae, mealworms and granary weevils, and the advantages (and possible disadvantages) of using certain chemicals for their control.

Some interesting experiences are described. For example, the insect *Stenolepisma urbani* will eat and thus damage onionskin and cellophane, will relish wax paper, glazed paper and bond paper, but will fail to eat newsprint, cardboard and brown wrapping paper. The infestation of a fungus after water damage of a document is illustrated in Fig. 1. Termite damage is shown in Fig. 2.

Fig. 1

An extensive list of over 50 agents that have been used as preservatives against microbiological attack are given. The best way of combatting insect attack is by using preventive methods before such attack actually occurs. In well equipped libraries, books and documents are evacuated, treated with ethylene oxide and carbon dioxide. Fumigation may also entail the use of mixtures of ethylene chloride and carbon tetrachloride, as well as a number of other fumigants, many of which are also toxic to man. Often the insects and their larvae are killed by these techniques, but the eggs remain alive. In such cases, the paper con-

taining materials may be kept isolated for another three weeks, and, when the eggs hatch, are resubjected to fumigation. In general the fumigants used have no significant effect on paper properties. Rodent attack is also mentioned, and this is more difficult to control; various chemicals used for this purpose are listed

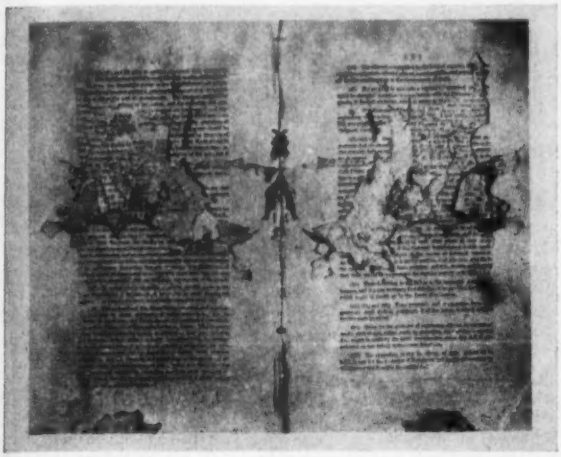


Fig. 2

(*e.g. warfarin*). Much work is still required to find an inexpensive chemical preservative that will be effective over long periods, which is non-toxic to man and has no serious disadvantages like odor, volatility, or deteriorating effects on paper. Forty seven references. Y. P. Kathpalia. *Indian Pulp & Paper,* **15,** No. 1,117-18,120-25 (July 1960).

Fiber swelling; the role of sorbed water

Fiber swelling is ordinarily determined by measuring the water retention after centrifuging under carefully standardized conditions. This has been referred to as the "centrifugal swelling value". However water is actually held in various ways by the fiber, and in the present paper, the authors seek to differentiate between the "adsorbed water" (*I*) and that which is fixed in other ways. (*I*) has also been termed "non-solvent water", and has been determined by swelling the cellulosic material in a variety of dilute salt solutions and of then noting the *increase* in the concentration of salt

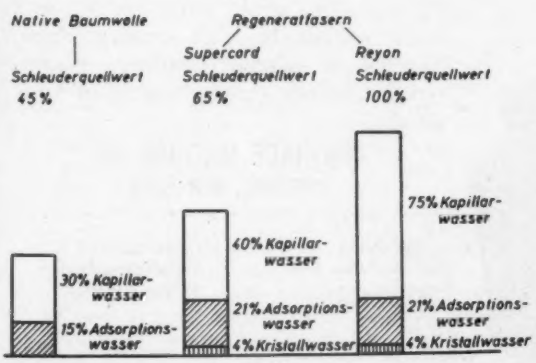
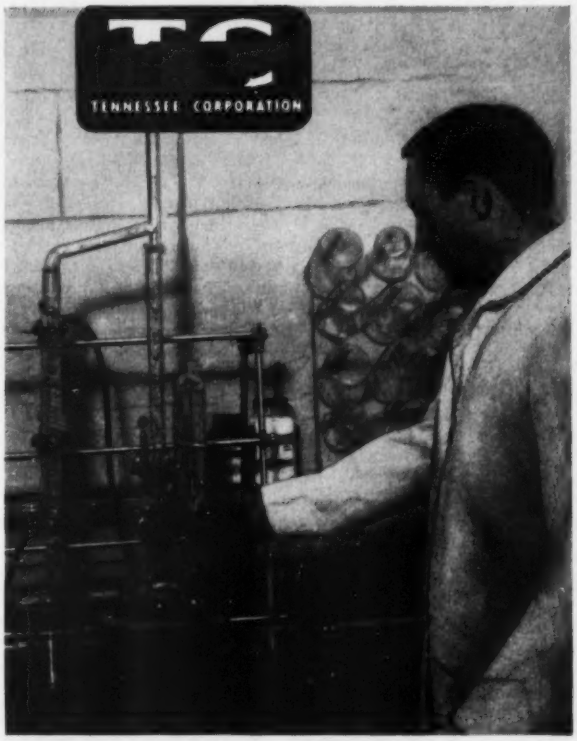


Fig. 3

in the solution. Celluloses that have been regenerated seem best adapted to the determination of (*I*), and sharp reproducibility was shown to be possible in making such determinations, especially when 1 per cent sodium thiosulfate was used. The values for (*I*) were always found to be much lower than those obtained by the



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centrifugal swelling method, and the (*I*) values were higher than those obtained for the sorption of water at 21°C. and 65 per cent relative humidity.

Values for (*I*) in the case of rayon, cord, supercord and Fortisan fell within the range of 23 to 30 per cent. Cotton showed an average of 14.9 per cent; linters pulp, 11.9 per cent, and mercerized linters pulp, 18.8 per cent. A sample of rayon that had been dried and alternately rewetted six times, and which had an initial centrifugal swelling value of 104, showed a significant decrease in this value as well as a decrease in (*I*) and in the degree of polymerization of the sample. At the end of the sixth treatment, the centrifugal swelling value had dropped to 63.5; (*I*) had decreased from an initial 25.8 to 21.9 per cent and the degree of polymerization had dropped from 311 to 234. Under similar treatment a supercord sample showed somewhat less drastic decreases. Data are also given for the distribution of (*I*) and fixed ("capillary") water in cotton, and for these values and "intracrystalline water" in supercord and rayon, whose respective centrifugal swelling values were 45, 65, and 100 per cent (cf. Fig. 3). Previous determinations of (*I*) for cotton, rayon and a hydrated cellulose are reviewed and discussed.

Thirteen references are included. Werner Kobilitz and Heinz Kiessig. *Das Papier* 14 179 to 185 (1960) (in German).

Surface smoothness of paper

This gives a comprehensive literature survey dealing with the more recent work on surface smoothness and its effects on printability. After a brief introduction, the author examines: the definition and determination of smoothness; factors affecting smoothness (*i.e.* the type of pulp, the press section, the dryer section, and the calender); the storage of paper prior to, and after calendering; the definition of and tests for printability; and the correlation between surface smoothness and printability. In the part on calendering, the following areas are treated: calender operation and theories regarding calendering and factors affecting calendering; machine calenders; supercalenders, static laboratory calenders, and a comparison between the various methods of calendering.

Sixty references are given, most of which are in English. Albin Andersson. *Svensk Papperstidn.* 63, 356-367 (1960) Original in Swedish with English summary.

Fibrous raw materials available in India

Various alarms have been sounded with regard to the shortages of raw materials used in the expanding Indian pulp and paper industry. Bamboo is the most important primary fiber and this is supplemented by *sabai* grass *(Eulaliopsis binata)*, waste rags, bagasse, and imported wood pulp. *Boswellia serata* wood is used in the manufacture of ground wood for newsprint. The amounts of available raw materials are estimated, and some of the earlier, rather discouraging estimates have been revised.

In the case of bamboo, the following possibilities for improvement are suggested: (a) an improvement in accessibility; (b) improving the yields from presently accessible materials (which now yield about one ton per acre whereas the range in Japan has been reported as three to five tons); (c) improvement in the techniques of cutting and transportation; (d) improving the methods of storage so as to avoid losses due to fungal and insect attack; (e) the adoption of a more enlightened policy by the State Forest Department, in leasing out bamboo forests to pulp and paper mills for longer periods on reasonable royalty terms; (f) establishing new bamboo plantations in the neighborhood of present-day pulp mills; (g) improving the methods of chipping and crushing, of cooking chips, and of bleaching the pulps.

The author also takes up the availability of such supplementary

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raw materials as *sabai* grass, bagasse, waste paper, and of native woods. A rather lengthy discussion of the accessibility of Indian conifers and deciduous woods is given. Apparently the Indian resources of bamboo, grasses and woods are entirely ample in meeting the targets tentatively set for the expansion of the Indian pulp and paper industry, as outlined in the so-called Third Five Year Plan, especially when certain obvious precautions are taken. Thus the alarms about shortages sounded by government agencies, industrialists, the F.A.O., and by various foreign experts are rather vigorously denied by the author, M. P. Bhargava who is a member of the Central Research Institute, Rohtas Industries, Dalmianagar, Bihar. *Indian Pulp and Paper* (Anniversary No.) 15, No. 1, 59, 61, 63, 65-67, 69-71 (July 1960).

Straw pulps with high strength properties

The pulp was prepared from well-cleaned wheat straw by means of a two-stage process. In the first step, the straw, at a stock density of 16.7 per cent, was heated 4 hours at 100° C. with 15 per cent caustic soda (based on the dry fiber). In the second stage, sodium chlorite (in sufficient amount to give 20 per cent active chlorine) and 5 per cent acetic acid were used; the stock density was 5 per cent and the digestion was carried out at 80° C. for 3.5 hours.

The properties of this straw pulp (I) were compared with those of a commercial wheat straw kraft pulp (II). The following were determined for II and I in the order named: yields, 44 and 56.1 per cent; degrees Schopper Riegler (prior to beating) 31.5 and 35.5; per cent ash 2.25 and 0.5; per cent silica 1.13 and 0.1; per cent α-cellulose, 69.4 and 75.4; degree of polymerization 793 and 1329; per cent water retention (after predrying) 153 and 216; transparency (determined by the Jayme-Pommer method), *Das Papier* 8, 259 (1954); printing opacity 0.872 and 0.797 (*loc. cit*); total "cadoxen color" (cf Jayme, *Das Papier* 12, 624 (1958), 9.852 and 3.342; brightness 80.5 and 86.8 per cent; brightness (after ageing and reversion), 74.5 and 84.6 per cent.

The following were determined for II and I after beating to 55 deg. (Schopper-Riegler), breaking length 8250 and 11000, tear factor (in cm.g./cm.) 89.5 and 114; burst (in kg/sq. cm.) 3.45 and 6.0; and double folds 250 and 3600. The marked differences in properties between the commercial sample (II) and the laboratory sample (I) are discussed.

Georg Jayme and Heinz Klein, *Wochbl. Papierfabr.* 88, 460 through 64 (1960) (in German).

Fiber structural changes in cold soda pulps

The structural changes taking place in the wood and wood fibers of *Eucalyptus regnans* and *Pinus radiata* during the preparation of cold soda pulps were studied. The lignin had been shown to be concentrated in the intercellular layer (middle lamella), the primary wall and the outer part of the secondary wall of the wood, which is in harmony with the results found in the case of European species. When wood chips were soaked in dilute alkali there was some swelling of the cell wall which, however, was restrained by the highly lignified regions of the outer portions of the fiber. When the alkali-soaked wood was passed through a Bauer refiner provided with breaker plates, and subsequently with rubbing plates, the region of the cell wall external to, and including the outer layer of the secondary wall, was broken away, thus exposing the relatively lightly lignified middle layer of the secondary wall, which thus became the bonding surface between the pulp fibers.

It is believed that the lower lignification of the intercellular layer in hardwoods (as compared with softwoods) may be a factor making hardwoods more suitable raw materials for the preparation of cold soda pulps. Electron micrographs of the pulps showed that the microfibrils are somewhat irregular in outline, and this may be due to adhering non-cellulosic polysaccharides and lignin. This conclusion receives some support from the use of electron-micrographic stains. The evidence is that in cold soda pulps, the direct cellulose-to-cellulose bonding is rare.

Twenty references. A. B. Wardrop and H. E. Dadswell. *J. Inst. Wood Sci.*, No. 2, 8 through 21 (Nov. 1958); through *Abstr. Bull. Inst. Paper Chem.*, 30, 1452 through 1453 (1960).

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PATENT REVIEWS

DR. MELVIN NORD

Semi-chemical Pulping Process

U. S. 2,949,395, issued Aug. 16, 1960 to Romulus S. von Hazmburg, describes a process for the preparation of semi-chemical paper pulp.

The process is shown schematically in Fig. 1. Wood chips having lengths between ⅜ and ⅞ inch are immersed in an aqueous buffered sodium sulfite solution having a pH between about 7.5 and 12 for a time sufficient to thoroughly impregnate the chips with the sodium sulfite in an amount, on a dry weight basis, of between 8 and 12 parts of sodium sulfite for each 100 parts of chips. The excess sulfite solution is then drained from the chips, and the chips, containing between about 8 and 12 parts of sodium sulfite, are cooked with steam under a pressure of between 175 and 300 psi at corresponding temperatures for a period of less than one hour but for a time sufficient to thoroughly soften the middle lamellae of the chips. The chips are then fiberized while still hot at a temperature of at least 150° F. in the presence of added hot water, to form the desired pulp.

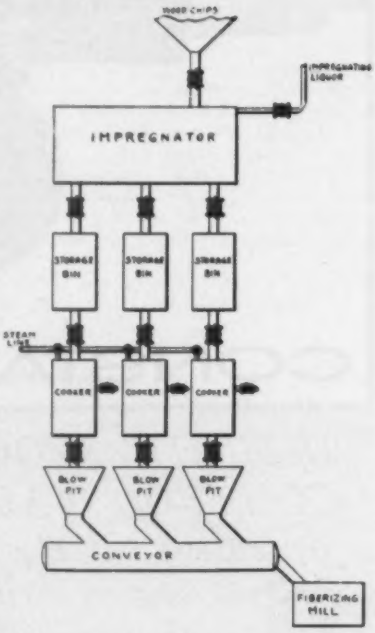

Fig. 1

Coating of paper

The wrong illustration erroneously appeared with this item in the October 1960 issue on page 524.

U. S. 2,937,955, issued May 24, 1960, to Joseph T. Loomer and assigned to Continental Can Co. Inc., provides a process by which a paperboard base of relatively low color may be coated, on the paper machine if so desired, with a mineral coating composition in sufficient thickness to raise the color to almost any desired value and with a smooth surface capable of taking the finest printing and capable of being varnished to produce an exceptionally high gloss. To this end the present invention provides a process and apparatus by which a ground coat of high solids content mineral coating composition is applied by roll coating with deliberate, or at least inevitable, formation of a well defined pattern. The ground coat is then dried to a point such that it is dry to the touch and, preferably, while it is still warm from such drying step, an over coating of relatively low solids content mineral coating compound is applied by doctor coating.

The doctor device is so adjusted as to level the over coating approximately upon the high spots of the ground coat whereby substantially to fill all of the low areas in the pattern of the ground coat. In this manner a heavy relatively rough ground coat may be applied and relied upon to cover and thus to upgrade the color of the base sheet. The over coating may be relied upon to supply an unusually smooth and level surface to meet the demands of printing and finishing. This entire process may be carried out on the paper machine as a continuous process integrated with the manufacture of the base sheet and it may be carried out at a wide range of operating speeds including those practical of the manufacture of such relatively low-priced products as the paperboard customarily used in the manufacture of folding boxes.

As shown in Fig. 2, a relatively dry web 10 is conducted over a stack of calender rolls 14, commonly known as a breaker stack. From the breaker stack the web 10 is conducted around a guide roll 16 and up through a roll coating device 17 provided with a coating roll 18 and a backing roll 20.

From the roll coating device 17 the web is conducted through suitable drying stages where the ground coat may be dried at least to a condition known in the art as "dry to the touch". For example, one or more dryer elements diagrammatically illustrated at 28 may be positioned immediately above the coating roll 18. The web 10 may then be conducted over a guide roll 30 to assume a generally horizontal path and further drying elements 32 may be disposed adjacent to the horizontal path if desirable.

The web 10 is then conducted over a backing roll 34 in such a manner that the surface having the ground coat on it is disposed outwardly. A doctor coating device 36 is associated with the backing roll 34 for the purpose of applying a second layer of coating material referred to herein as an over coat. The doctor device serves to force or trowel the over coat material into the low spots or areas of the ground coat and to level the surface of such over coat approximately even with the highest spots or areas of such ground coat.

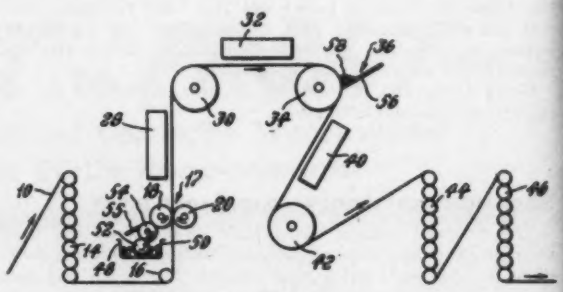

Fig. 2

After the application of the over coat in the doctor coating device 36, the web 10 may be conducted past one or more dryers such as 40. The capacity of the dryer or dryers 40 is such that the two layers of coating material will be rendered sufficiently dry to be safely conducted over the surface of a guide roll 42. From the guide roll 42, the web 10 may be conducted over one or more finishing calender stacks 44 and 46. From the last finishing calender stack the web 10 may be delivered to a reel or sheeter, as desired.

Wet Strength Paper

U. S. 2,949,396, issued Aug. 16, 1960 to Francis A. Bonzagni and assigned to Monsanto Chemical Co., describes a process for preparing paper having high wet tensile strength.

The process consists of adding to an aqueous suspension of cellulosic paper-making fibers a water-dispersible acid-aged, catonic, sulfite-modified, melamine-formaldehyde resin, and forming the treated cellulosic fibers into a waterlaid sheet.

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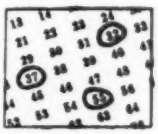

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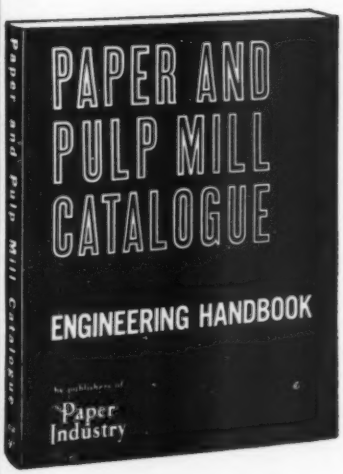

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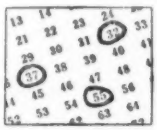

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The manufacturer is making available a brochure describing the application and use of these materials. Included is a color diagram indicating the actual color changes corresponding to changes in temperature of each product. *Princeton Division, Curtiss-Wright Corp.*

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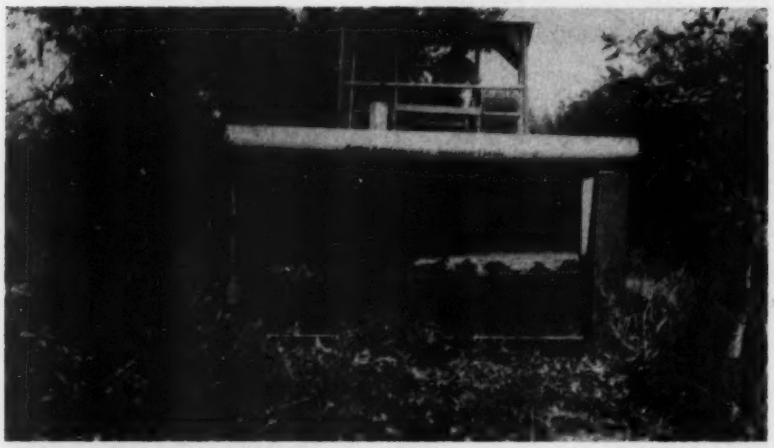

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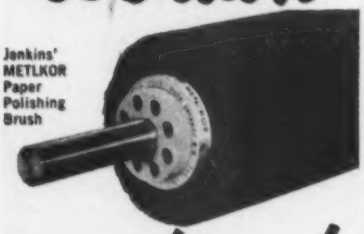

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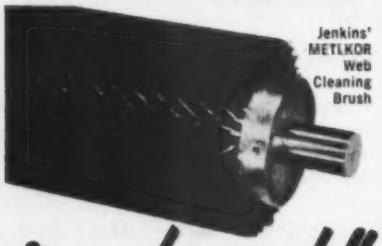

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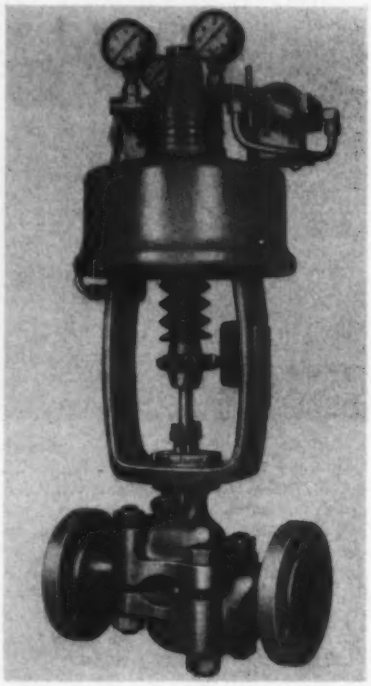

Split-body valves

A series of split-body valves interchangeable on a mix and match basis is now available in straight-through, angle and corner types with fixed or separable flange construction. Designed for free passage of even highly viscous fluids, the valve features metal or Teflon guiding, non-lubricated V-ring packing, and contoured equal-percentage, linear or quick opening plugs. *Minneapolis-Honeywell Regulator Co.*

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Seven packaged air make-up units for use wherever outside air must be brought inside the plant to replace air exhausted in processing operations, are now available. The units are for supplying, 20, 30, 40, 50, 60, 70, and 80,000 cfm.

Each air make-up unit comprises a galvanized sheet-metal enclosure. One end of the unit fits an outside wall opening and is equipped with intake louvers, bird screen and shut-down dampers. The other end is equipped with a fan which draws the air from out-of-doors and directs it into the plant.

A rectangular gas burner inside the enclosure operates on natural or manufactured gas, and the fuel supply is automatically regulated to heat incoming outdoor air to the desired temperature. Standard air make-up units are also available for steam heating. *J. O. Ross Engineering, Division of Midland-Ross Corp.*

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Compact pneumatic products

A new line of compact pneumatic products consisting of small, high-performance manual and automatic-drain, compressed air filter, pressure regulators, diaphragm relief valves and lubricators, is now available. The regulators and relief valves are used with air, water, oil and similar fluids. All units are made for ⅛ in. pipe size, but can be constructed for ¼ in. pipe size. *C. A. Norgren Co.*

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Industrial flo-ball valve

An 8 in. fail-safe industrial flo-ball valve with a spring return is now available. Equipped with a top and bottom guided ball and a floating seat, the new valve is top loading for easy access to the internal assembly without removal from the line. Materials of construction are either carbon or stainless steel. *Hydromatics Inc.*

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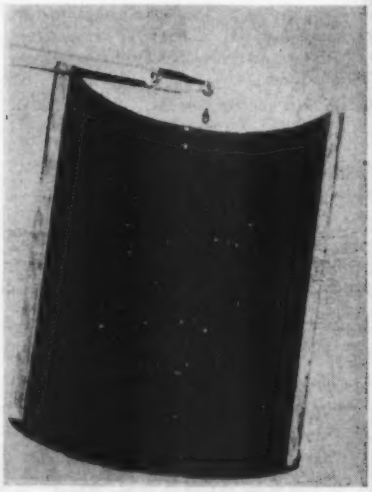
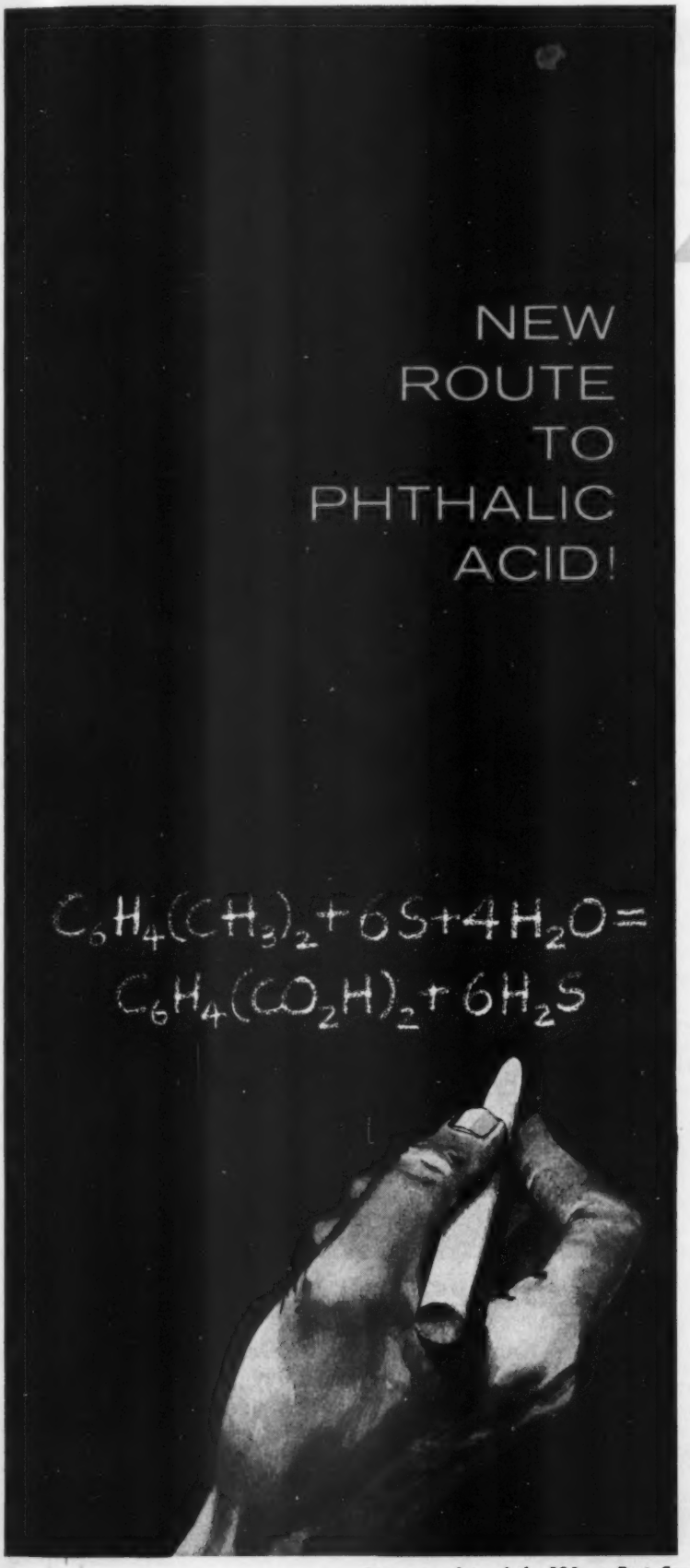


Filming amine

A new filming amine, Super Filmeen, contains 31 per cent more filming action than ordinary octadecylamine acetate, and does not require acid resistant mixing tanks and feed pumps. It may be mixed with any type of dilution water and fed to any point in the system. Separate feed equipment is not required, permitting the easy application of filming amines directly to the boiler. A cleanser of internal scale, Super Filmeen removes the layer of scale and corrosion



SULPHUR
helps to create
headline products

In a report to the Petroleum Division of the ACS, Dr. William G. Toland of the California Research Corporation recently announced the development of a new method for producing Phthalic Acid, with the following over-all reaction:

$$C_6H_4(CH_3)_2 + 6S + 4H_2O = C_6H_4(CO_2H)_2 + 6H_2S$$

Note that the presence of Sulphur right smack in the middle of this reaction is necessary for its completion. The Sulphur leaves the process at this point. The hydrogen sulphide can be oxidized to elemental Sulphur and returned to the initial reaction. It is thus operable in a closed cycle.

According to Dr. Toland, who developed this new route to phthalic acid, the process is simple and capable of high recoveries.

Here is another good example of how strongly Sulphur is in the processing picture. Together with its many derivatives it enters into countless reactions.

TEXAS GULF SULPHUR COMPANY
75 East 45th Street, New York 17, N. Y.
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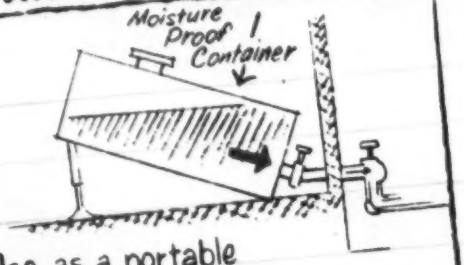
Sulphur Producing Units: Newgulf, Texas
Spindletop, Texas • Moss Bluff, Texas
Fannett, Texas • Worland, Wyoming
Okotoks, Alberta, Canada

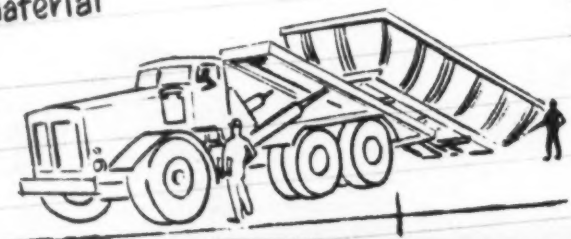
For more data circle 134 on Post Card

Materials Handling Ideas with the Dempster Dinosaur



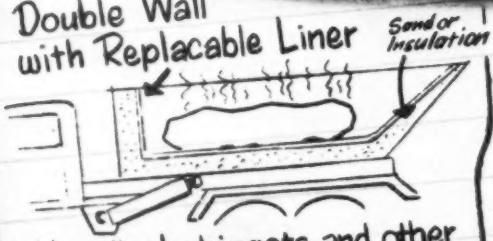
Use as a portable Hopper for temporary storage of wet or dry material

Use as a portable cable reel station - or for handling rolls of paper or steel

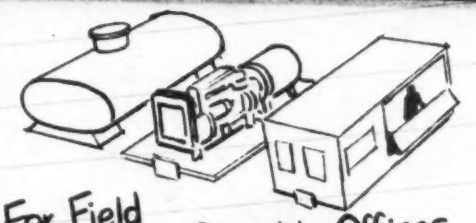


Shift heavy in-plant movements from rails to rubber with Dinosaur and 100,000 lb. capacity trucks... For slag... ingots... stone or chemicals.

Double Wall with Replacable Liner



Handle hot ingots and other materials with insulated containers.



For Field Operations Portable Offices, Tool Sheds, Generators, Fuel Tanks, Compressors etc. can be moved to the site by the Dinosaur.

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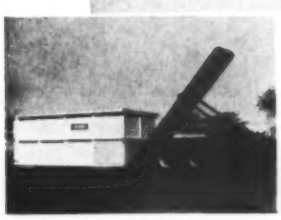
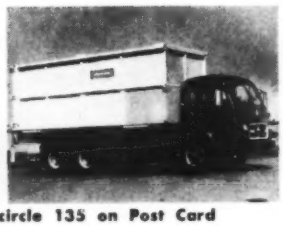




The DEMPSTER DINOSAUR

For more data circle 135 on Post Card

New Products . . .

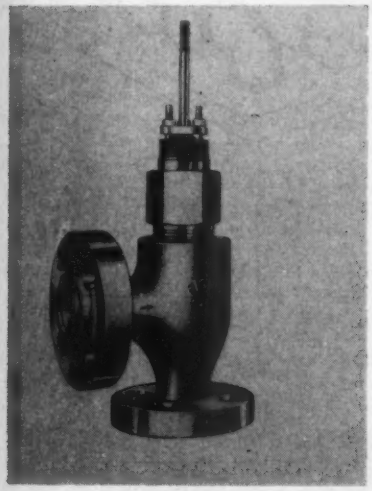
from the steam side of the paper drier rolls and prevents the formation of further deposits. *Dearborn Chemical Co.*

Circle No. 9 on Readers' Service Card

Fluid filter and strainer

A new line of Double Duo fluid filter units with reducing streamline smooth flow, three-way inlet, outlet and backwash blowdown valves, is now available. These filters are used for clarification of any fluid containing foreign particles in suspension such as dirty water, viscous liquids, chemicals or oils and fluids with pipe scale or iron particles. Rated 5 to 150 gpm, 10 to 700 mesh, with pressures to 200 psi. and temperatures to 200° F., the filters are available in bronze, steel, monel metal or aluminum. *Ronningen-Petter Co.*

Circle No. 10 on Readers' Service Card



Flanged end connections

Now available are integral flanged end connections on high pressure 1 and 2 in. angle and globe style cast steel valve bodies for oil and gas production, power plant installations and the process industries, in either 1500 or 2500 lb. ASA flanges. Maximum operating temperature is 450° F. Stellite facing on the seat ring and valve plug is offered at no extra cost. Orifice sizes are ¼, ⅜, ½, ¾ and 1 in. *Fisher Governor Co.*

Circle No. 11 on Readers' Service Card

Heavy duty sight feed valves

Heavy duty sight feed valves control the dispensing of a liquid volume and visually indicate its flow in a sight chamber. The orifice or port has been enlarged, which makes this new valve capable of taking care of higher flow rates. A new swivel arrangement allows viewing windows to be turned into any direction.

These units are used on gravity or pressure oiling systems for bearing lubrication where capacities of oil must be dispensed. Their construction makes them especially suitable for paper mill machinery and gear units. *Oil-Rite Corp.*

Circle No. 12 on Readers' Service Card

Bow expander roll

A new bow expander roll, Aquatrol Expander, utilizes thin water film for a simpler, maintenance-free operation. With only one moving part, this new roll has nearly frictionless rotation. The sleeve floats on a film of water to give uniform, even spreading action over every increment of face width. *Rodney Hunt Machine Co.*

Circle No. 13 on Readers' Service Card

Moisture Analyzer

A high speed general purpose industrial moisture analyzer has been designed especially for process and quality control systems. Employing a new method of moisture determination by means of radio frequency

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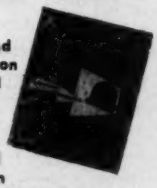

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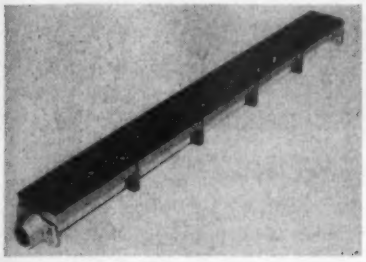
For more data circle 137 on Post Card

New Products . . .

power absorption, the polytechnic moisture analyzer offers laboratory accuracy under factory conditions.

Its moisture content range is 0 to 80 per cent and accuracy is from 0.001 to 0.5 per cent. The machine is said to be foolproof, simple to operate, rugged, compact and versatile. It is of valuable use to the chemical, drug, paper and plastics industries. *Boonton Polytechnic Co.*

Circle No. 14 on Readers' Service Card

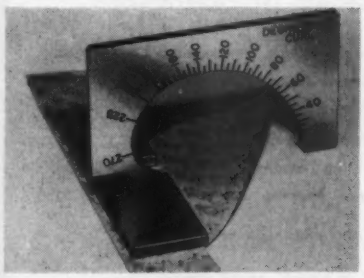


Infra-red line burner

Individual units of the new gas-fired, infra-red line burner can be built up into panels or continuous lines without a complex pipe manifold for gas distribution. The burner operates at mixture pressures up to 16 in. w.c. and lights the full length of extended lines from one pilot. Elimination of a requirement for individual inlets, controls, and pilots for each unit provides a considerable saving in installation costs.

A unique internal distributor assures uniform heat that is insensitive to air pressure variation. This, plus wide turndown, gives the burners versatility in application that includes textile drying, food processing, paper drying, mold and die pre-heating, and plastic applications. Each burner section is 6 in. wide by 12 in. long, with a capacity of 30,000 BTU. Flanged ends permit quick and sturdy assembly. *Infraline Inc.*

Circle No. 15 on Readers' Service Card



Curl tester

The new curl tester determines the amount of curl which occurs in paper when the relative humidity is changed. In making the test, a paper sample is conditioned to 50 per cent relative humidity for 15 minutes, after which the amount of curl is recorded. This process is then repeated at various humidity levels. *Testing Machines Inc.*

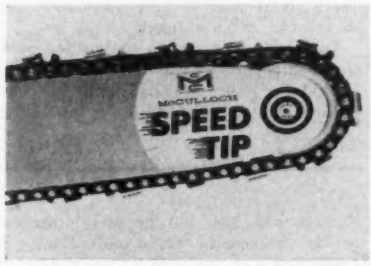
Circle No. 16 on Readers' Service Card

Submersed gear pump

The Eco Gearchem Pump is mounted vertically below a reactor or pressure vessel cover plate with motor drive mounted above, outside the vessel, and is installed as a unit. In such services as pumping out vessels under high vacuum, pumping high temperature materials, and pumping out of vacuum into atmosphere, this submersed pumping unit eliminates problems of shaft seal leakage, heat-traced plumbing and low NPSH.

Both ⅜ and ¾ in. pumps can be supplied with this pump and motor drive mounting, and if necessary, are custom-built to individual needs. *Eco Engineering Co.*

Circle No. 17 on Readers' Service Card



Roller-bearing bar for power chain saws

A new chain saw cutter bar that features a roller-bearing tip is said to greatly expedite chain travel, and to eliminate the principal cause of failure in bars of this type. The tip wheel, which fits under close tolerances into tapered side plates, has 29 roller bearings of high carbon steel to provide smooth and fast action of the outer rim. Centered in the hub is a felt oil retainer that acts as a constant source of lubrication for the bearings. *McCulloch Corp.*

Circle No. 18 on Readers' Service Card

Anatase titanium dioxide pigment

The new grade of pigment is known as Zopaque LD-C, and is especially designed for the paper industry. It combines the better brightness, color and hiding power of the anatase form of titanium dioxide with the unusual ease of dispersion and low viscosity characteristics of the rutile form. The pigment is equally well suited for on-and off-machine, size press, and calender coating operations, and is compati-

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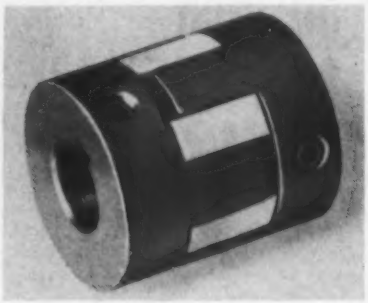
New Products . . .

ble with all other common paper coating pigments and the adhesives used to bind them. *Glidden Co.*

Circle No. 19 on Readers' Service Card



Corrosion-resistant flexible couplings

Stainless steel and glass-filled du Pont Teflon have been combined to provide a chemical-resistant flexible coupling for pumps handling corrosive media, where leakage along shaft or chemical atmospheres would cause rapid deterioration of ordinary coupling materials. Self-aligning, these couplings compensate for mismatch, misalignment and end movement of the shaft within reasonable limits. The couplings may be removed from the shaft for servicing the pump gland without dismantling. *Eco Engineering Co.*

Circle No. 20 on Readers' Service Card

Wall mounted chlorinator

A wall-mounted chlorinator has been developed for use in municipal and industrial water and waste treatment facilities. This manually-operated chlorinator can maintain an accuracy ± 2 per cent of feed reate over a 20-to-1 range in flow. A simple snap-in flowmeter tube allows capacity changes from 3 to 200 lbs. of chlorine gas per day without the use of tools. *Fischer & Porter Co.*

Circle No. 21 on Readers' Service Card

Unstacker and trimmer loader

Trimmer production has reportedly been increased from 30 to 40 per cent per day by one operator's use of a new automatic unstacker and trimmer loader.

Designed to operate in conjunction with any existing or new trimmer in the finishing room of paper and board mills, converters and printers, the machine is said to be capable of handling practically any size or weight of trimmer lift. Grades ranging from delicate light-weight sheets to printed and varnished coated stocks, can be automatically unstacked with this device. *Chas. R. Stevens Inc.*

Circle No. 22 on Readers' Service Card

Diaphragm relief valve

A super sensitive diaphragm relief valve for service where corrosive chemicals are a problem, is now available in stainless steel, bronze and hastelloy C for the valve body. Connections are screwed or flanged, and it may be mounted in a horizontal or vertical position.

The valve is excellent for chemicals, slurries, and other liquids and gases where a tight relief valve is essential. In the water treatment field, where acids and alkalies in concentrated form cause damage to most valves, this valve is said to remain free from corrosive action. *Farris Engineering Corp.*

Circle No. 23 on Readers' Service Card

GET THE SCOOP ON SCOOPS

If you have a dryer drainage problem, don't do anything about it until you see the movie—

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NEW LITERATURE

Books

WORLD DEMAND FOR PAPER TO 1975, Published by the Food & Agriculture Organization of the United Nations, Rome, Italy.

Essentially a study of regional trends, this English language edition studies the projecting demand, the forecast of demand, future needs, and recent developments of the pulp and paper trade. Background data is drawn from a series of tables and charts which include comprehensive figures from the world's leading nations.

The book has been written for exposition rather than for prophecy, and may help governments, development authorities and industries in the preparation of their medium and long-term plans for developing pulp and paper sectors.

METALLIZING OF PLASTICS, by Harold Narcus, president and technical director, Electrochemical Industries Inc. Published by Reinhold Publishing Corp., New York. Pages: 256. $5.50.

This book presents complete details for carrying out every commercial metallizing process for plastics or other non-conductors. It is the first treatment of the subject to deal with actual production procedures, formulations and techniques for all known metallizing methods.

The author includes numerous illustrations showing the latest equipment being used in the newer processes. Throughout, recent advances in the field receive special attention. More than a bibliographic source, this book is essentially a metallizing manual for the plastics, electronics and electroplating industries.

Booklets

MECHANICAL PULPING MANUAL. This new monograph has just been published by the Technical Association of the Pulp and Paper Industry (TAPPI) and is aimed at groundwood mill operators and the young technical man entering the industry. This publication is available at $5.00 per copy and may be obtained from TAPPI, 360 Lexington Ave., New York 17, N.Y.

GROW WITH AN EXCITING BUSINESS is the title of a new career booklet prepared by the Paper Industry Career Guidance Committee of the Paper Industry Management Association. The booklet includes descriptions of jobs within the industry, a list of colleges offering course work in all facets of papermaking and the scholarships available to qualified students. Copies of the booklet are offered at 20c each in lots of one to 100; at 15c each for 100 to 1,000; and at 10c each in lots of more than 1,000. Orders should be sent to: Paper Industry Career Guidance Committee, 38th floor, 122 East 42nd St., New York 17, N.Y.

USDA Reports

EIGHT NEW RESEARCH REPORTS are now available from the Director, U.S. Forest Products Laboratory, Madison 5, Wis. Report 1769-26, Can American Elm Be Dried Without Excessive Warping?; Report 2196, Decay Resistance Of Experimental and Commercial Particle Board; No. 2197, Importance of Balanced Construction in Plastic-Faced Wood Panels; No. 2189, Sulfate and Prehydrolysis-Sulfate Pulps for Nitration; No. 1877, Deflection Characteristics of Two 20-ft. Diameter Laminated Wood Rings Subjected to Compressive Loading Along a Diameter; Technical Note No. 263, FPL Show-Through Comparator for Furniture Panels; Report No. 2193, Significance of Tension Wood in Furniture Cuttings of Red Oak; Report 2194, A Method of Indirect Calculation for Use in Log Grade Analyses.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Cylinder actuator line

Conoflow Corp. is offering a new data sheet describing the company's complete line of cylinder actuators. The illustrated data sheet is designed to describe construction features and application of the actuators.

Circle No. 24 on Readers' Service Card

Detachable containers

Dempster Bros. Inc. is offering a catalog brief on detachable containers. Illustrated are the various types of waste disposal machines: Dempster-Dumpmaster, drop and tilt bottom containers, and the Dempster-Dinosaur. Catalog numbers and capacities are given.

Circle No. 25 on Readers' Service Card

Haul-up conveyors

B. L. Montague Co. is making available a bulletin on log and lumber conveyors. The

NOW—CHECK ACCURACY WHILE YOU CHECK MOISTURE!

New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard*, Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field*. You get practical accuracy down to 0% ... 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

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- Open discussions of controversial safety problems.
- A view of what others are doing for safety in the paper and pulp industry.
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- News of new safety devices that can be used in your operations.
- News of the safety people, projects and achievements within your industry.

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bulletin illustrates the motor, chain, drive and bearings, and shows how various units are designed for individual specifications.

Circle No. 26 on Readers' Service Card

Brandon Felts

Brandon Sales Inc. is offering a bulletin on profit-making. The various advantages and services provided by the company are illustrated, and the regional representatives are listed.

Circle No. 27 on Readers' Service Card

Mechanical debarkers

Budow Machine & Mfg. Co. Inc. has released a bulletin on the company's mechanical debarkers. Illustrated and described in detail are the 26, 28 and 36 in. debarkers.

Circle No. 28 on Readers' Service Card

Replacement Screen cylinders

National Perforating Corp. has issued a publication describing replacement screen cylinders to fit the Shartle 24-P Selectifier Screen. All standard specifications are listed.

Circle No. 29 on Readers' Service Card

Roll neck seal

Syntron Co. announces a new two-page bulletin of roll neck seals containing data and illustrations of the complete line of seals for sealing both work and back-up rolls in strip mills, tempering mills and other rolling mill. The bulletin also contains information and description of Syntron fluid couplings for rotating, hollow shafts and internal seal parts.

Circle No. 30 on Readers' Service Card

Wall chart of conversion factors

Precision Equipment Co. has produced a reference table for engineers and other executives in wall chart form. Included are common conversions such as inches to centimeters or watts to hp as well as; atmospheres to kgs/sq. cm; cm/sec to miles/hr; cu. ft. to liters; microns to meters; quintal to lbs.; and others difficult to locate in reference manuals.

Circle No. 31 on Readers' Service Card

Flow meters

Minneapolis-Honeywell Regulator Co. is offering a catalog and instrument data sheet on the Whirl-Flo meter which uses the vortex-velocity principle for measuring liquids and gases. This meter can be combined with a densitometer or a variety of electronic instruments to measure mass flow.

Circle No. 32 on Readers' Service Card

Conversion factors table

Ohmart Corp. has published a pocket-size conversion factors table for reference use by production, process, and instrument engineers. It deals with weight-volume, gravity of light and heavy liquids, base weight, power, temperature, pressure, flow and length-area.

Circle No. 33 on Readers' Service Card

Marking rule card

Proper Marking Association announces the availability of a marking rule card that every shipper will be glad to have in his shipping department. It contains export marking data, conversion equivalents and military marking specifications.

Circle No. 34 on Readers' Service Card

Acrylic emulsions

Rohm & Haas Co. announces the availability of its new 20-page booklet—Rhoplex Acrylic Emulsions for Saturation, Beater Addition and Synthetic Fiber Bonding. Ample graphic and tabular data simplify the selection of the proper resin or blend of resins to achieve the desired balance of physical properties. Details are also presented on the characteristics of the emulsions and the techniques of incorporating them into the paper.

Circle No. 35 on Readers' Service Card

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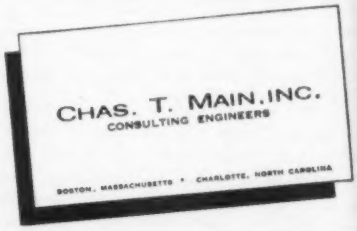

Safety course

The National Safety Council is offering a study-by-mail safety course for industrial foremen, which has solved the problem of keeping these men on the job while they acquire the necessary safety information. Based on educator-approved teaching methods, the course emphasizes the basics of accident prevention and provides supervisory training during a foreman's at-home hours.

Circle No. 36 on Readers' Service Card

Speed reducers

Link-Belt Co's new 36-page booklet describes their complete line of balanced design parallel shaft reducers. It includes information for selecting the correct drive for every application and thermal and mechanical horsepower rating tables for each input and output speed.

Circle No. 37 on Readers' Service Card

Cast-tooth sprockets

Link-Belt Co. has just published a book on stock sizes of cast-tooth sprockets. There are 132 different chain numbers listed and cross referenced to 48 sprocket lists. The basic types of sprockets are illustrated.

Circle No. 38 on Readers' Service Card

Speed reducers

U. S. Electrical Motors Inc. is offering a new brochure containing technical information on shaft-mounted, geared speed reducers as well as illustrations, featuring descriptions and selection and ordering instructions on the U.S. Shaftmount Syncrogear.

Circle No. 39 on Readers' Service Card

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A. W. J. Dyck

Editorial Director, The PAPER INDUSTRY

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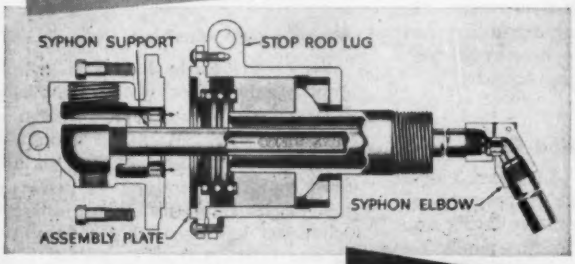

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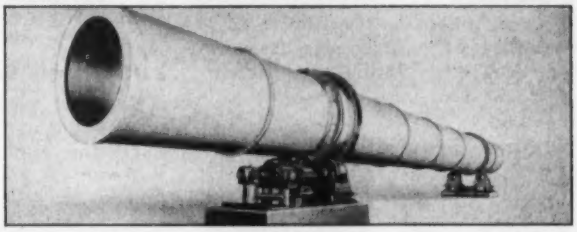

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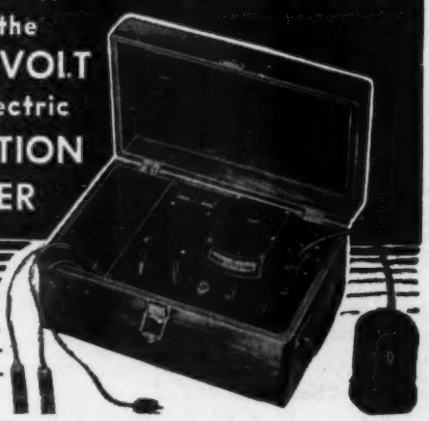

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Names in the News . . .

(Continued from p. 679)

sin and Minnesota. Howland formerly was president and general manager of the Thomas Phillips Co., Akron, O.

D. A. Cumfer

F. J. Keating

United Container Co.

Frank J. Keating has been appointed vice president — mills operation of the company. As vice president, Keating will continue his present duties with the additional responsibilities of the mills.

Donald A. Cumfer has been named general manager—mills operation for the company. Cumfer was with the Mead Board Corp. as assistant director of the product planning division.

Mead Corp.

R. L. Boehm was appointed manager of the corporation's Leominster, Mass., Division, succeeding C. H. Horch. Boehm has been serving as assistant division technical director for the last three years at Chillicothe.

C. H. Horch has been appointed general manager at Chillicothe Paper Co. He had been serving as manager of the Leominster Division.

George W. Ruth Jr. was promoted to assistant production manager at Chillicothe. Ruth had been superintendent of finishing operations at Chillicothe since 1957.

Morse Chain Co.

Robert J. Koch has been appointed southwest regional sales manager of this company. Koch's headquarters will be at the new Morse Warehouse, 2702 Chenevert St., Houston, Texas. This territory will include the states of Texas, Louisiana, Mississippi, Oklahoma and Southern New Mexico.

Gatke Corp.

Four new sales engineers have been appointed by this company: Les Patterson of Chico, Calif.; Howard R. Bassett Jr. of Taunton, Mass.; Frank K. Moyer of Berwyn, Ill.; and Albert H. Dyer of Reading, Ohio. The Gatke Corporation manufactures moulded fabric suction box covers and moulded fabric bearings for the paper industry.

L. H. Shingle Co.

E. Grady Sinclair Jr. has been appointed southern district manager of this leather products company. Identified with the production of industrial leathers for over 25 years his experience includes product research, quality control, and field sales engineering.

Karl M. Berkheiser was also assigned to the company's southern territory. His major assignment will be on the company's NYCOR and REVO belting for the pulp and paper industry. New headquarters for Shingle Co.'s southern territory will be at 14 Woodfern Circle, Greenville, S. C.

Stauffer Chemical Co.

Henry L. Schulle has been appointed a sales representative of the Industrial Chemicals Division of this company. He will be headquartered in Stauffer's Houston office.

Groveton Papers Co.

Lester D. Fogg, has retired as consultant to the Woodlands Department of the company. Fogg served as woodlands manager and buyer at Groveton until 1957. He then became a consultant until his retirement.

Nalco Chemical Co.

William M. Stephenson has joined the company as a staff engineer. This is part of a plan for expanding their marketing staff. Stephenson attended the Institute of Paper Industry.

Standard Packaging Co.

Glen E. Speidel has been elected vice president of the corporation. He will be in charge of Standard's Consumer Products Group, which includes Fonda Container Co., Royal Lace Paper Division, and Normandie Cup Division. Before being elected, Speidel was president and chief executive officer of the Kalamazoo Sled Co. and the Kalamazoo Furniture Co.

Continental Can Co.

Thomas E. Cathcart has been named general manager of sales for the Boxboard & Folding Carton Division of the company. Cathcart, formerly folding carton sales manager, replaces Wray Callaghan. He has been with the company since 1946.

Richard T. Clark succeeds Cathcart as folding carton sales manager. Clark was formerly national product sales manager for the company's Foiline products and has been with the company since 1949.

Wisconsin Wire Works

Wesley G. Price of Ashburnham, Mass., has been appointed sales representative for the New England territory. Price was formerly associated with Gulf Oil, and Orton Corp.

Tidland Machine Co.

Donald M. Gomer has been added to this staff as sales engineer, and will present the company's capacity for designing and manufacturing specialized custom-built equipment for pulp, paper and converting industry. Gomer previously was with Lamb-Grays Harbor.

U.S. Department of Commerce

Alfred S. Nalle was named assistant director for Mobilization Planning, Forest Products Division, Business & Defense Services Administration, of the Department of Commerce. Nalle was special assistant to the vice president of sales, of the West Virginia Pulp & Paper Co.

Crystal Tissue Co.

Nicholas R. Repke has been hired as plant engineer. In his new position he will be giving special emphasis to the power plant area. Repke is a member of TAPPI and PIMA.

Manchester Machine Co.

James H. Little has been named industrial engineer of the company. He formerly was general foreman at Giddings-Lewis Machine Tool Co. Manchester Machine is one of the most rapidly expanding companies in the papermaking-machinery industry, producing machines of the fourdrinier and cylinder types as well as component parts.

Packaging Corp. of America

G. Ronald Wilmer has been appointed to the new position of general superintendent of Container Plants. Wilmer will assist the company's container plant personnel in their operating problems, and will help them improve production meth-

(Continued on p. 698)

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
America linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b New York:

	per cwt.	
No. 1 roofing (Chicago)	.55—	.60
No. 2 roofing (Chicago)	.40—	.45
Twos and blues, repacked	1.75—	2.00
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords

New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shapperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—	100.00
No. 1 hard white shavings	80.00—	85.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	60.00—	65.00
Fly leaf shavings No. 1	17.00—	22.00
Fly leaf, woody, No. 1	17.00—	20.00
Mixed colored shavings	16.00—	18.00
No. 1 books and magazines	18.00—	20.00
Ledger stock, white, No. 1	40.00—	45.00
Ledger stock colored, No. 1 (Midwest ship)	30.00—	32.50
New manila envelope cuttings (free of groundwood)	55.00—	60.00
New manila envelope cuttings (containing groundwood)	45.00—	50.00
Manila tab cards	55.00—	60.00
Colored tab cards	42.50—	45.00
New northern kraft envelope cuttings	55.00—	60.00
Triple sorted kraft, 100%	35.00—	37.50
No. 1 old kraft	25.00—	
White news cuts, No. 1	40.00—	45.00
No. 1 overissue news	15.00—	17.00
Folded news, special	13.00—	14.00
Folded news, ordinary	11.00—	12.00
Old corrugated boxes	15.00—	16.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	9.00—	11.00
Boxboard cuttings	4.00—	5.00
No. 1 mixed paper	1.00—	6.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30½—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.14½—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	—
N	—
WG	—
WW	—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	—
N	—
WG	—
WW	—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be. 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.32—
Pearl, 100-lb. bags, cwt.	7.17—
Powdered, 100-lb. paper bags, cwt.	7.29—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09½—
High-tinting, drums, c. l., lb.	.14½—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	140.00—
Bleached sulfite, Canadian	140.00—
unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	135.00—140.00
Bleached soda, Canadian	135.00—140.00
Kraft, bleached hardwood	135.00—140.00
Kraft, bleached	145.00—150.00
Kraft, bleached southern	135.00—140.00
Kraft, bleached Canadian	150.00—
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	128.00—125.00
Kraft, semi-bleached southern	130.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Newsprint (contract base price) per ton	
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	9.00
60-lb	9.25
50-lb.	9.50
40-lb.	9.75
35-lb.	10.25
30-lb.	11.00
25-lb.	11.75
20-lb.	12.75
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.50
(Sheets — Plus 50c cwt)	

Names in the News . . .

(Continued from page 696)

ods and equipment. He will make his headquarters in Grand Rapids.

Edward Martin, has been named general manager of three container plants forming the Quincy Unit of the corporation. Martin founded the Marshalltown, Iowa, Container Co. in 1950.

KVP Sutherland Paper Co.

Dwight L. Stocker, has been elected to the board of trustees of the Institute of Paper Chemistry, Appleton, Wis. He is president of the KVP company, and will serve a five-year term ending in 1965.

Harold Heinbuck has been appointed as process engineer with the Technical Department of the company.

Keep America Beautiful

Frank K. Greenwall, chairman, National Starch & Chemical Corp., was elected president of this national public service organization for the prevention of litter. He succeeds the late Cecil F. Dawson, former director and consultant of American Can Co.

Spaulding Pulp & Paper Co.

Sidney M. Collier has been elected executive vice president and general manager. Active in industry association work, Collier is a long-time member of TAPPI and PIMA, and a past chairman of the Western Canadian Technical Association.

Knowlton Bros.

Myron C. Durkee has joined the company as technical assistant to the production vice president. In the newly created post, Durkee will assist in the management of the plant's production facilities. This company manufactures specialized paper for industry.

Pulp & Paper Foundation Inc.

Chester G. Landes, chemical consultant of Charlotte, N. C., has been appointed Assistant Professor of Pulp & Paper Technology in the School of Forestry, at North Carolina State College, Raleigh. Landes will begin teaching at the Robertson Pulp & Paper Laboratory.

Roy Wilson Hunter will be an instructor in pulp technology lab. He is on leave of absence from International Paper Co., Pine Bluff, Ark., where he is employed as first assistant chief chemist.

Earl Libby, resigned Department Head, has retired agreeing to act as executive secretary to the Foundation.

R. G. Hitchings has been designated as acting department head in place of Libby while the search continues for a permanent successor.

H. Waterbury & Sons Co.

S. R. Jerry Roslund has been appointed west coast sales representative, a position previously held by his father, John Roslund. Prior to working as an associate with his father, Roslund completed an intensive training program in both production and sales at the company mill.

S. R. J. Roslund

D. W. Crookall

Crest Chemical Corp.

David W. Crookall has been appointed sales manager of the paper and leather chemicals department. Crookall and the sales organization will begin immediately to provide to the paper and leather trades more direct service and more technical information.

Necrology . . .

Millard C. Teague

Millard C. Teague, director of quality control at Allied Paper Corp., Kalamazoo, Mich., died in Brevard, N.C. Teague joined Allied in Dec. 1958 and was associated for many years with Ecusta Paper Corp., Pesgah Forest, N.C.

Ernest L. Kurth

Ernest L. Kurth, one of the south's leading industrialists and chairman of the board of Southland Paper Mills Inc., Lufkin, Texas, died in Lufkin. In the past Kurth had been President of the Angelina County Lumber Co., president of Southern Pine Association of New Orleans and vice-president of the National Lumber Manufacturers Association of Washington, D.C. He was noted for gambling his money and reputation to set up a newsprint mill using yellow pine as the base material.

Bicket Nairn

Bicket Nairn was the retired president and general manager of the M. D. Knowlton Co., Rochester, N. Y. He had been with the company since 1938 and was president and manager when he retired in 1956.

Lester W. Crouse

Lester W. Crouse was sales supervisor of Penick & Ford Ltd. in the mid-Atlantic and New England districts. Crouse had worked in and among eastern paper mills and paper converting plants for 40 years and was active in both TAPPI and PIMA.

Fred W. Van Liew

Fred W. Van Liew was former mill manager of Kimberly-Clark Corp. in Niagara Falls, N.Y. He headed Kimberly-Clark operations in this area from 1937 until retirement in 1950.

Charles Clay Smith

Charles Clay Smith was former sales manager for Bemis Bros. Bag Co., Buffalo, N.Y. Smith, one of the best known sales managers in the east, boasted 51 years of service for the same company.

Milton R. Bailey

Milton R. Bailey was executive vice president of Bulkley Dunton Pulp Co. Inc., Kalamazoo, Mich. Bailey took charge of the Kalamazoo office in 1939, and was widely known in the pulp and paper industry.

Vernon Eugene Slater

Vernon Eugene Slater was a superintendent of production for Zellerbach Paper Co., San Francisco, Calif. Slater had been with the company for 35 years.

Robert E. Bundy

Robert E. Bundy died in Lewiston, Idaho. He was president of Potlatch Forests Inc.

Charles H. Champion

Charles H. Champion was vice president of R. T. Vanderbilt Co. Inc., New York. Champion was manager of the firm's paper department and an expert on the production of specialized paper for printing.

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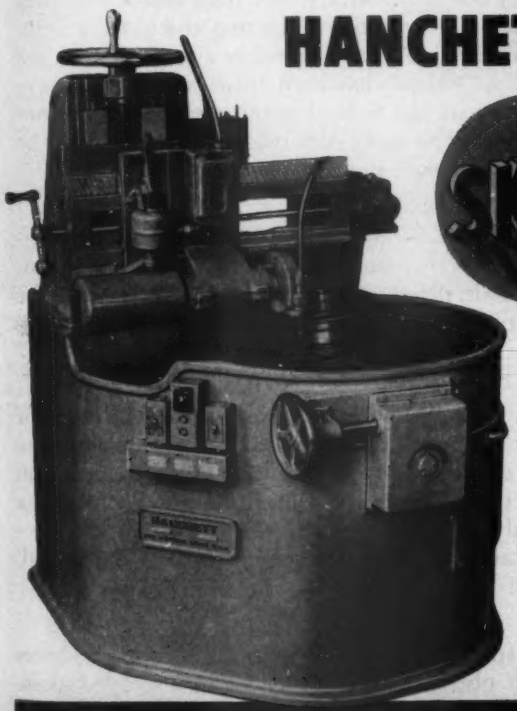

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New improved process for drying pulp and paper

The new infrared process developed by Horace L. Smith, Jr. uses an Arochlor product — a high boiling point, non-flammable, liquid heat transfer medium. The radiating surface of the equipment used is almost perfectly "black" and transmits radiant heat efficiently at all wave lengths.

The new process' advantages in pulp drying are reported to include: (1) investment in equipment is cut from $750,000 to $350,000; (2) operating costs are reduced by one third; and (3) installation time is significantly reduced.

Larger paperboard drums for hot-melt products

Mead Corp. has introduced larger and more flexible paperboard drums of 300 lbs. to 500 lbs. capacity for such hot melt products as asphalts, resins, waxes, adhesives, etc. The containers are available with aluminum foil or polyethylene moisture barriers and an interior hydroxyethyl cellulose coating developed by Mead.

Antibiotics used against blister rust

Antibiotics have been used successfully against blister rust, which has spread through large areas of white pine forests in this country. The treatment consists of spraying the trees with the antibiotics which then attack and stop the spread of rust-colored, cancer-like growths which ring and kill the trees.

The economic importance of blister rust control is apparent from the fact that an annual average of $1,500,000 has been spent over the last five years by private land owners and state and federal governments in an attempt to bring this disease under control. The antibiotics treatment seems to be the first feasible large-scale method to achieve this purpose.

New interleaving and rubber separating paper

Riegel Paper Co. has announced the introduction of Strip-Ease, a new interleaving and separating paper. It is a silicone-coated kraft paper that will not stick to tacky rubber, pitch, asphalt, plastic compounds, etc., and is said to be durable enough to permit multiple reuse in many rubber processing applications.

No cause to worry about water shortage?

According to Dr. R. D. Hoak of the Mellon Institute, Pittsburgh, reuse of water may be one of the most important technological developments in the next 10 to 25 years. A 300 per cent reuse of water, instead of the current 100 per cent reuse, would permit twice the present output of goods without a significant increase in industrial fresh water demand.

Only one third of all water used in the U. S. A. is actually consumed, according to Dr. Hoak.

Avisco announces two new durable films

These films are special combinations of two light gauge cellulose base sheets with a thin polymer resin inner ply. One of the films has an improved moisture-proof, heat sealing, nitrocellulose coating on both sides; the other has a special polymer coating on both surfaces to give strong heat sealing and excellent moisture and gas-proof characteristics.

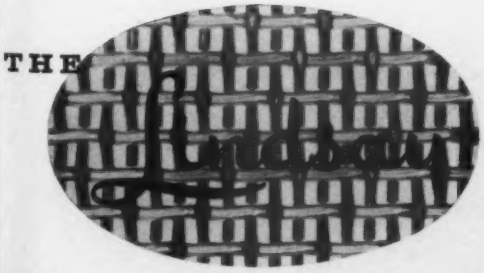
The films are designed for numerous packaging and industrial non-packaging applications.

The LINDSAY Technical Services Staff

WORKS CONTINUALLY TO HELP IMPROVE PAPER QUALITY

Left to right—Bob Howard, sales representative; Paul Johnson, Technical Services staff; Charlie Pennings, sales representative; Al Hose, Technical Services staff.

Lindsay sales representatives have frequent occasion to meet with members of the Lindsay Technical Services Division in Cleveland. *Purpose:* to discuss real conditions and find practical answers to problems which arise in the plants of paper manufacturers.



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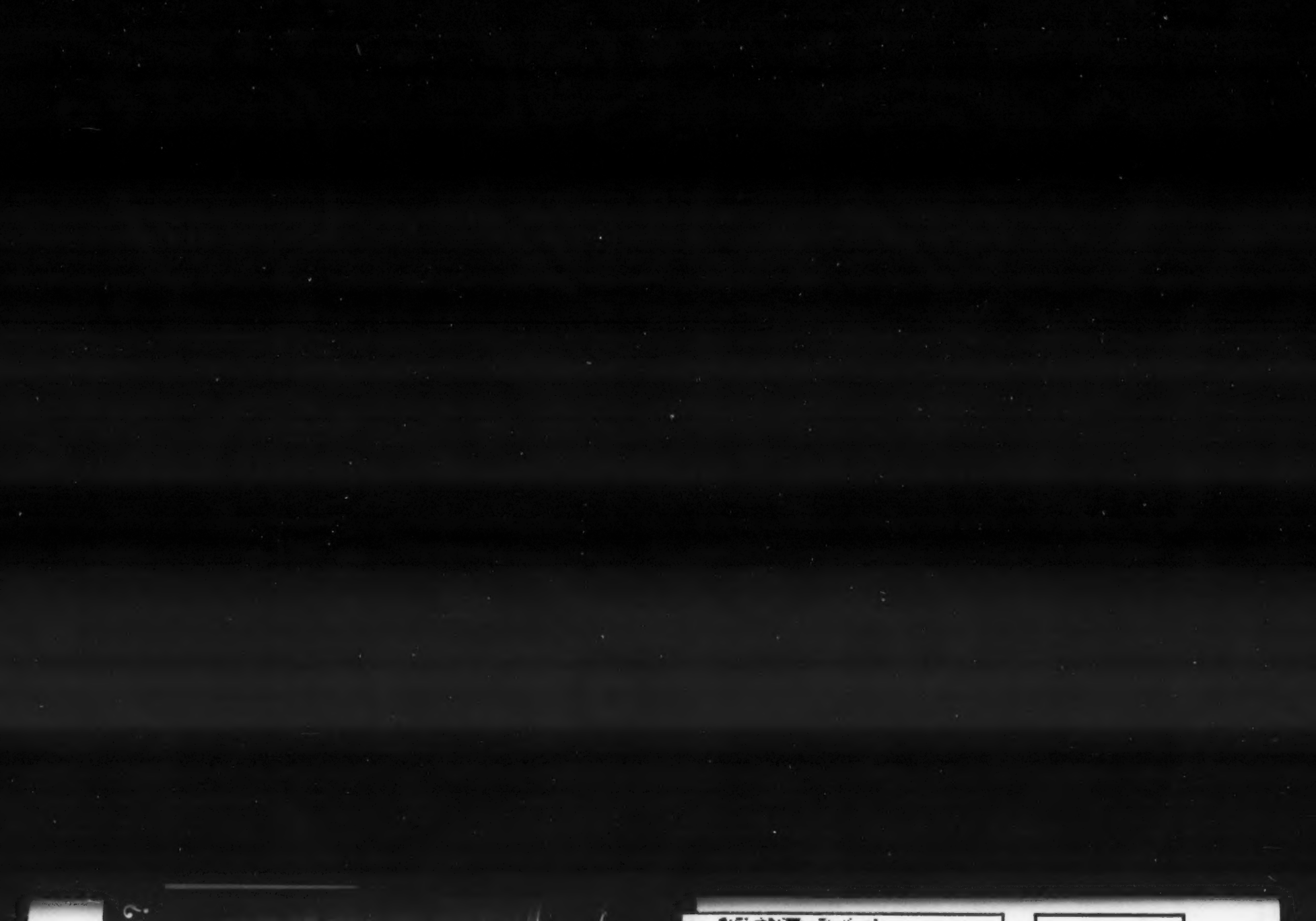
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